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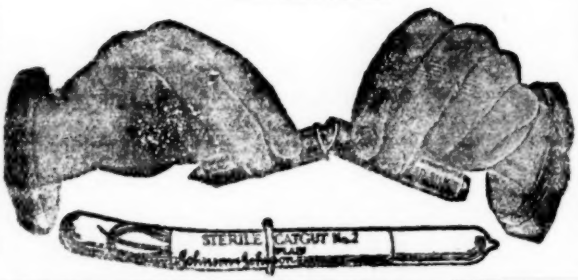

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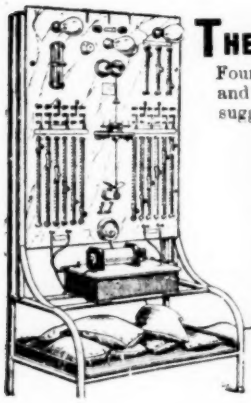

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LECTURE III.*

MR. PRESIDENT AND FELLOWS,—In this, my third lecture, I propose to consider the treatment of cœliac disease.

This section of my subject I approach with considerable diffidence, for in face of the modern therapeutics which the brilliant investigations of laboratory workers in chemistry and bacteriology have made applicable to many diseases, one feels almost out-of-date in offering suggestions and observations based chiefly on clinical experience.

As, however, I have shown in the previous lecture, it has not been possible to trace cœliac disease to one specific cause. Until this has been done, or until the clinical grouping which has been called by this name is shown to be divisible into several different specific entities, the treatment must necessarily be more or less symptomatic and empirical. In the meantime experience has shown that certain lines of treatment are definitely valuable in many cases included under this heading, and these I shall try to indicate; moreover, as negative observations are sometimes hardly less important than positive, I shall refer also to the failure of various methods which on theoretical grounds have been thought worthy of trial.

DIETETIC TREATMENT.

One of the outstanding features of cœliac disease is failure of fat assimilation.

This failure has not only a negative result in depriving the child of important material for nutrition, but also a positive result in leaving in the food-residue in the bowel an excess of fatty substances which favours putrefactive change, and in this way may lead to local irritation and secondary infections, and more remotely may cause symptoms of toxic absorption. Possibly also the excess of fat remaining unabsorbed may interfere with the digestion of other food by covering it with an oily coating which digestive secretions have difficulty in penetrating. Failure of assimilation of any element of food is liable, in various ways, to have a more profound effect upon nutrition than the mere loss of that particular element would entail, for by its secondary effects in the bowel it may, and evidently does, interfere with the absorption of other food elements.

Reduction of Fresh Cow's Milk.

I suppose this to be the reason of the value of a diet from which fresh cow's milk is altogether excluded. I place this point foremost in the treatment of "cœliac disease," for I know of no other item of equal importance. Experience shows also that it requires emphasis, for the tendency is to put such a case upon milk and more milk, as the one thing needful, whereas nothing is more likely to retard recovery.

Dr. Gee's experience led him to the same conclusion. "Cow's milk," he says, "is the least suited kind of food for them"; but he attributes this intolerance of milk to the curd, not to the fat. "Nothing is more certain," he adds, "than that cœliac children cannot digest the hard curd of ruminants' milk."

I think the balance of evidence is against this explanation of the harmfulness of cow's milk in this disorder. As he himself points out, peptonising milk does not make it any more suitable for these cases, as it should do if the difficulty were chiefly or entirely curd indigestion. I would add that the use of dried milk, the curd from which is much less tough and consequently much more easily digested than that of cow's milk, produces little or no improvement in the stool unless the proportion of fat in the dried milk is much less than that in the fresh milk. The stools show no evidence of curd indigestion, whereas they do show very marked deficiency of fat absorption. Cream, even much diluted, is not tolerated, as it should be if the milk difficulty was due only to the curd.

My own observations, in agreement with those of other clinicians, show that the best results are to be obtained in the dieting of these children by reducing the fats to a minimum, and as the food in which fat is chiefly given at the age when these children come under treatment is cow's milk these observations have applied chiefly to this particular form of fat.

Dried Milk with Reduced Fat.

I have found most successful the replacement of fresh milk altogether by a dried milk containing only a small proportion of milk fat.

The particular brand—"Cow and Gate Half Cream"—which I have used is stated to contain half the proportion of fat present in milk.

Analyses showed that dried milk requires using with special precautions, otherwise the proportion of fat in the food may be very different from that intended. The very light, almost flaky, powder is very easily compressed, so that if on opening a full tin of this half-cream dried milk a fully-heaped, large-sized teaspoonful is taken and added to 1 oz. of water the resulting proportion of fat is no less than 3·1 per cent. (the amount of the powder taken thus was found to be about 75 gr.), whereas if the powder be turned out of the tin or shaken up, as it would be in a partially emptied tin, the same teaspoon heaped fully with the loose powder contains barely 50 gr. and gives with 1 oz. of water only 1·8 per cent. of fat.

Why the small amount of cow's milk fat contained in the dried milk should be better tolerated than the same proportion of fat in fresh cow's milk is not apparent.

Indeed, one would rather have expected the reverse, for the emulsion of the fat in a solution of dried milk is so imperfect that it tends to form into visible droplets on the surface and forms a greasy coating on the vessel in which it is given. Sometimes, indeed, I have wondered whether the loss of a certain amount of fat to the child in this way may not have facilitated the digestion of these preparations.

Human and Other Milk.

It might very reasonably be argued that if the fat is the difficulty then any milk which contains as high a proportion of fat as cow's milk should be equally unsuitable.

This, however, is not so. The difficulty of assimilating the fat of fresh cow's milk seems to be a specialised intolerance, for the fat of human milk, though present in larger proportion than is often found in cow's milk, is seemingly tolerated excellently by these children.

Usually their age makes it difficult to utilise this form of feeding, but in two cases where life seemed to be seriously threatened by cœliac disease, I was able to obtain human milk, which was used in one of them from the age of 2¼ years for nearly a year, and in the other from the age of 20½ months until the child was 2 years and 11 months old.

In both cases the human milk seemed to be the turning point in the illness, and its use was followed by great improvement in the stools and in the child's general condition, so that one case made a complete recovery, though with some stunting of growth, and the other, last seen at 3 years and 10 months, showed no arrest whatever of growth and was able by this time to take both cow's milk and goat's milk.

In connexion with this special value of human milk I would recall a fact which I have already mentioned, that none of my cases of cœliac disease began in an infant who was still at the breast.

One of the most successful substitutes for cow's milk is asses' milk.

This might be expected from the very low proportion of fat which it contains, commonly not more than 1 per cent. Whether this is the whole explanation may, however, be doubted, for cow's milk, even when diluted so as to reduce the proportion of fat to this extent, or when used in the form of whey, which contains usually not more than 1 per cent. of fat, is still much more liable to render the stools loose and offensive.

Apart from the proportion of fat present it is recognised that there are differences in the characters of the fat in the milk of different animals, notably in their melting point, also in the proportion of butyric acid present as well as in other respects, and it may be that these differences determine the digestibility of different kinds of milk fat, and therefore their relative suitability in such a condition as cœliac disease.

Fat Derived from Other Sources.

Fats other than those present in milks have also proved unsuitable.

I have tried the oil obtained from soya bean in the form of an artificial milk, Sólac, containing 3·3 per cent. of fat according to one analysis, and 3·75 per cent. according to another, but in spite of good emulsion this was not successful; it aggravated the looseness of the bowels.

Cod-liver oil also is not available to replace the milk fats, for it is usually tolerated badly in this disorder.

Another form of fat which, though tolerated by some of these children in small quantities, increases the symptoms in others, is that present in the yolk of egg.

The evidence of intolerance of these various fats is the increased looseness of the stools and still more their offensive character. The reduction of the proportion of fat in the diet produces not only diminution of looseness but a better colour and less offensive odour of the stools, and therewith a definite improvement in the child's general condition, and particularly in the weight.

Carbohydrates.

The diet, however, must needs consist of something more than a milk very poor in fat if any continuous improvement of nutrition is to be obtained.

There is apparently some difficulty in dealing with starches, though much less than with fats.

Unfortunately, one form of starch which seems particularly liable to aggravate the symptoms is bread. I know of no adequate substitute. Rusks have seemed less harmful than bread, probably owing to the fact that the starch in them is partially dextrinised; they help to satisfy the child's craving for something solid. For this reason, though they contain very little carbohydrate, I have used biscuits made with dried

* Lectures I. and II. were published in THE LANCET of August 10th (p. 183) and 17th (p. 193), 1918.

milk, with just enough wheaten flour to give a crisp consistency; there have been at least two such in the market, "Nurso" and "Malac" biscuits. Sugar is allowable only in small quantity.

A form of carbohydrate which generally suits these cases is "Revalenta," prepared from lentils; this made thin with a solution of the dried milk and sweetened with sugar, though not very palatable, is generally taken well. Rice boiled in water for three or four hours so that it is almost a jelly is another form of carbohydrate which has usually succeeded.

These foods, with the addition of chicken broth or veal broth and sweet jellies, have made up the total dietary, in some cases, for a year or more, and if anyone tries to draw up a menu from this list he will find that it is meagre indeed. If eggs are tolerated it eases the difficulty considerably. Pounded chicken, or fish, or meat, or brains, generally make the looseness of the bowel worse, and are only suitable when the child is already improving.

Apart from the fact that such a diet is unsatisfying to the child, it is definitely scorbutic.

Five of my cases developed scurvy at ages varying from 4½ years to 10½ years. All of these were on dried milk and the diet I have mentioned, a proof incidentally that these dried milks, if they contain vitamines at all, do not contain sufficient to prevent scurvy. Obviously, it is important to give some antiscorbutic, and sometimes there is no difficulty, for grape-juice can be given to some without increasing the looseness of the bowels, but usually fruit juices and green vegetables have to be avoided on this account.

Other Diets.

Various have been the efforts to find a diet upon which these children will do well.

One of the most remarkable is that mentioned by Dr. Gee: "A child who was fed upon a quart of the best Dutch mussels daily throve wonderfully well, but relapsed when the season for mussels was over; next season he could not be prevailed upon to take them. This is an experiment," he says, "which I have not yet been able to repeat."

There may have been more reason in this method of feeding than at first appears, for, like most of the diets which have succeeded, it is one containing a low proportion of fat. Moreover, while containing a high proportion of proteid, it contains, of course, no carbohydrate. The mussel contains 12·5 per cent. of proteid and only 1·6 per cent. of fat.

I have tried in some cases a so-called "fat-free" diet with marked success.

From this even the dried milk and egg are excluded, and the diet consists of rusks, Robb's biscuits, jellies, chicken and veal broth, rice boiled in water, revalenta, mashed potato, pounded chicken or fish, barley water or weak tea with sugar. On this diet there has usually been great improvement and in six cases slow but steady recovery.

In this diet the potato fulfils a double purpose by not only providing a considerable number of calories, but also a most effective anti-scorbutic. It has seemed to me to be better tolerated in this fat-free diet than when given in a diet including milk, dried or otherwise. This impression is confirmed by one's experience in some of the commoner digestive disturbances of childhood, where one has often noticed that the combination of oily substances—for instance, butter—with potato seems to render the potato particularly indigestible, possibly for the reason already suggested, that the fatty material forms an envelope around the starch granules preventing the diastasic action of the amylase of the salivary and pancreatic secretions.

Diet with Little or No Fat: Freedom from Rickets.

It might be thought that a diet practically devoid of fat, or even such a régime as that previously mentioned in which the fat is reduced to an extremely small amount without being excluded altogether, would, when continued for months, or, as has been necessary in some cases, for two or three years, produce serious harm; especially when it is used, as it is almost always in this disease, at an age which should be that of rapid development. I have already pointed out that in spite of the deficient fat assimilation caused by the disease rickets is strikingly absent in the large majority of children with cœliac disease; and now I will add that even when fat is eliminated entirely or almost entirely from the diet these children still show a remarkable freedom from rickets.

Other Routes of Introducing Fat: Inunction.

Admitting, however, that in this direction the low proportion of fat in the diet does no harm, it must still be desirable from the point of view of general nutrition to secure the absorption of fat if possible, and the question arises whether for purposes of tissue building fat can be introduced by any other route than the alimentary canal.

There is some evidence not only that it can be absorbed but that it can be used for tissue building when injected into the subcutaneous tissues. Such a mode of administration is obviously undesirable for children, especially as it would have to be repeated many times and for a long period.

Can fat be introduced by inunction?

If so, it would be simple enough to compensate for the deficiency of fat digestion. There is plenty of evidence that various substances applied in oils or ointments are absorbed—e.g., mercury in mercurial ointment or iodoform in oil or in vaseline; but this is no proof that the fat of the oily vehicle is absorbed also.

I have sought in vain for confirmation of statements that cod-liver oil and other fats can be introduced through the skin. The only experimental evidence which I have been able to find was that obtained by Lassar, who smeared the shaven skin of rabbits with rape-seed oil three times a day for two or three days, and found that the liver and kidneys after this short time were full of fat globules. He stated also that olive oil and cod-liver oil passed through the skin into the deep organs.

As far as I know, these experiments have not been confirmed, and it has been pointed out (Reid[15]) that the skin of mammals usually employed for such experiments is thinner than that of man and more vascular, and in the case of the rabbit in particular contains hair follicles with wide mouth, so that the conditions are not strictly comparable.

If fat can be absorbed through the skin it must presumably be without the fat-splitting and subsequent synthesising which are supposed to be necessary to its absorption through the bowel. It is difficult to believe that if with such special adaptation to absorption as is shown in the structure of the intestinal mucosa such an elaborate process is necessary to the absorption of fat it can be absorbed without any preparation at all through such a structure as the skin.

It is much to be desired that careful clinical observations under strict conditions could be made on this particular point.

Most of us have ordered inunctions of oil many times for wasting children, who sometimes have thereupon gained weight and sometimes not, but there are so many possible fallacies, and so few cases offer the exact conditions favourable to any decisive conclusion, that such inunctions are usually rather the therapeutics of hopefulness than the therapeutics of conviction. Personally, I have been under the impression that any good accruing was due rather to the friction and perhaps the warm covering of oil than to any real absorption.

It is important for investigation that the cause of the wasting should be mainly, if not entirely, failure of fat absorption by the bowel. The presence of some other cause of wasting, such as tuberculosis or any general failure of digestion, will make the results of inunction even more doubtful, as any gain from skin absorption may be counterbalanced by loss of nutrition from other causes. In "cœliac disease" we have a condition in which presumably the predominating factor in the failure of nutrition is failure of fat absorption from the bowel, and therefore a state of things particularly suited to this investigation.

Results in Cases Treated by Inunction.

With this point in mind, I tried the effect of inunction with peanut oil (oleum arachis), two drachms being rubbed in twice daily for about 15 minutes.

The patient was a boy aged 7½ years who had been under my care in hospital for five weeks with cœliac disease without gaining weight. On admission he weighed 28 lb.; at the end of five weeks only 25½ lb. At this stage the daily inunction was begun, and the boy's weight steadily rose so that in the next eight weeks he gained 8½ lb., and this in spite of the stool being often very pale and slimy and purpura appearing most of the time.

This observation is certainly suggestive of the possibility of fat absorption through the skin, but I am bound to admit that even with such a favourable opportunity for investigation as cœliac disease my results in other cases have been equivocal.

In one case the inunction, done with cotton-seed oil, and subsequently with peanut oil, produced no definite gain in weight, whereas in another case of cœliac disease in the same ward, where the weight had been stationary for many weeks, the weight began to rise almost steadily, and the child's condition improved enormously without any change in the treatment, and in particular without any inunction.

An unexplained improvement like this has happened in several cases where the disease had already lasted two or three years without any permanent progress. It behoves us, therefore, to be careful in attributing results to our treatment, whether it be fat inunction or any other.

TREATMENT BY DRUGS, ORGANIC EXTRACTS, AND VACCINES.

Another method of overcoming the fat difficulty which has been tried in these cases is the administration of digestive extracts.

In view of the striking results obtained by Dr. Byrom Bramwell in cases of pancreatic infantilism, a condition associated, like that we are considering, with failure of fat assimilation, it seemed possible that pancreatic extracts would be of value in cœliac disease.

I have repeatedly used them, trying in various cases the glycerine extract specially recommended by Dr. Bramwell, also the preparation sold under the name of "holadin," and that sold as "trypsogen," but none of them have appeared to me to have any obvious beneficial effect, a confirmation, incidentally, of the conclusions reached in my previous lecture that the failure of fat assimilation is not due to the failure of the pancreatic secretion.

I have also tried ox-gall on the theory that the biliary secretion was deficient, but without any improvement in the stools or in the child's condition.

Calomel.—Digestive Extracts.

Dr. Cheadle recommended calomel as stimulating hepatic secretion, as well as having some antiseptic value.

So far as my own experience goes, the facts certainly do not fit the theory, for calomel, and even grey powder, seem to aggravate the bowel disturbance and to be particularly unsuitable for these cases.

Dr. Cammidge quotes one observer as having found that calomel, so far from diminishing the number of bacteria in the fæces, may actually cause an increase, presumably by increasing the mucus which serves as a favourable nidus for bacteria. Whatever may be the explanation it certainly does not improve either the stools or the patient in cœliac disease.

The difficulty in digestion of carbohydrates, particularly of starch, which is only less than the fat difficulty, naturally suggests the administration of malt for its diastasic effect. This, however, is also found to be inadmissible in most cases, for it seems rather to promote flatulence and looseness.

It would seem, indeed, so far as any direct influence can be exerted upon the absorption of fats and carbohydrates in cœliac disease, it is rather to be accomplished by rigorous dieting than by any drugs or digestive extracts.

Astringents.

Drugs, however, even if they are of but little assistance in this affection to the digestive processes which prepare the food for absorption, may still be of real value if they can render the intestinal mucosa more healthy, and therefore more capable of absorbing.

Post-mortem examination has shown that, at any rate in a fatal case, there may be definite inflammatory change in the intestine, and the

presence of much mucus in the stools during life, especially when the disease has already been present for a long time, shows that there is at least much intestinal catarrh, and these changes are apparently due, in part at least, to bacterial irritation and partly to the irritating effect of putrefaction.

It might be supposed that this could be diminished in two ways, either by drugs which exert an astringent effect upon the mucosa, or by those which have some antiseptic value and in this way prevent bacterial growth and putrefactive changes.

Most of the astringents, whether vegetable or mineral, have proved useless in my hands; the only one which has an undoubtedly good effect is castor oil.

Given in small doses, three times daily, it usually causes more or less improvement.

A mixture of 5-minim doses of castor oil with salol 2 or 3 gr. in mucilage and water has such a pronounced effect in improving the stools and checking looseness that in several cases the child took it almost continuously for some years, and the parents stated that any attempt to discontinue it was usually followed before long by deterioration in the character of the stools, so that the medicine had to be resumed.

It has always seemed to me difficult to understand how five drops of castor-oil can have any astringent effect on 20 feet of intestine, but however it is to be explained there is no doubt that it has a very definite action in this respect.

Another astringent which, though much less reliable than castor oil, is certainly sometimes useful in cœliac disease is silver nitrate, which in doses of ¼ or ½ gr. ter die seems to reduce the looseness of the stools in some cases.

Bismuth has seemed to me to be usually of little, if any, value in these cases, perhaps because it was used in the traditional doses of 10 gr. or even 5 gr. three or four times a day, whereas the radiographers have taught us that bismuth can be taken by the ounce without ill effect, so that recently infants in my ward sometimes have 3½ gr. of bismuth carbonate every three hours, and a child of three as much as 60 or 70 gr. several times a day.

Chromo-santonin.

Having in mind the resemblance in many points between cœliac disease and sprue, I have tried in three cases the chromo-santonin, which Dr. Charles Begg has found to have remarkably beneficial effects in sprue.

It was given, as he directs, in a gelatine capsule. There were no records from which the dosage proper to children of this age and suffering from cœliac disease could be gauged, so I was obliged to feel my way cautiously, beginning with amounts which, no doubt, were too small, and perhaps even finally not reaching a sufficient dose. A child 6¼ years old, weighing 21 lb., took 2 grains twice daily without any definite effect.

In one case, the girl aged 17½ years whom I have mentioned before, the administration of the chromo-santonin was followed by immediate improvement of the stools, which became less offensive and less loose, and there was rapid gain in weight.

In another, a girl aged 3¾ years, and weighing 15¼ lb., there was no marked alteration of the stools whilst the chromo-santonin was given—increasing doses up to 1 grain twice daily were used—but just after the course of this drug was stopped there was great improvement in their character; they became firmer and a better colour than they had been for months.

Clearly, further observations are needed on the value of this drug in cœliac disease. In the doses used it produced no ill-effects of any kind; the greenish-yellow discolouration of the urine due to santonin was observed in 15 hours after it was taken, but this is of no importance.

Dr. Begg considers that the chromo-santonin has a bactericidal action.

Intestinal Antisepsis.

Other drugs have been tried in this affection with the idea of intestinal antisepsis.

In one, at the age of about six years, iodoform gr. ½ was given for six months, apparently with markedly beneficial effect.

Salol has also seemed to do good.

Perhaps in the same category should be mentioned ionisation with sodium salicylate at one electrode; this was done in one case under my observation. A 2 per cent. solution of sodium salicylate was used on one pole on the abdomen. During this treatment, which was carried out for many weeks, the child very definitely improved, though she subsequently relapsed and died.

In one case I tried radium water; half a pint was given daily by mouth, without the slightest benefit.

In one of the recorded cases appendicostomy was done with a view to overcoming intestinal infection by irrigation through the appendix. Some improvement of the child's general condition started after this was done. Autopsy, however, showed that there was inflammation involving the whole of the small intestine as well as the large, so that it could hardly be expected that this treatment could do more than palliate symptoms.

Vaccine Therapy.

The discovery that a considerable proportion of the cases examined gave evidence of intestinal infection with a dysentery bacillus, as shown either by the finding of the organism in the stools or in the mucus from the bowel, or by the positive result with the agglutination test, naturally suggested that a vaccine might be of value.

I have used an autogenous vaccine of the dysentery bacillus in two cases where the bacillus had been obtained from the stools and a stock vaccine of dysentery bacillus where, although the organism could not be found in the stools, the agglutination test gave a positive result.

In both the cases where the autogenous vaccine was used there was very definite temporary improvement both of the stools and of the child's nutrition for about a fortnight, after which the condition again deteriorated in spite of continued use of the vaccine. The vaccine was administered in the one case in doses of 5 millions, increased gradually up to 200 millions; in the other the initial dose was 60 millions, increased later up to 150 millions.

In the third case, where only a stock vaccine was available, and was used in doses increasing from 25 millions gradually to 150 millions, no effect whatever was observed.

In one case where the dysentery bacillus was absent, but the stools showed many streptococci and pneumo-bacilli, a vaccine was used of pneumo-bacilli and streptococci in increasing doses up to 100 millions of each; no effect whatever, either for good or ill, was observed.

Internal Secretions.

The striking arrest of growth in these cases has raised a suspicion that one or other of the internal secretions might be deficient.

In three cases under my observation thyroid was given, but without the slightest advantage. It did not seem to promote growth nor to improve the general condition; indeed, one of them seemed rather the worse while taking it. This symptom is one for which treatment is specially sought in the cases which reach convalescence. The child herself is distressed by the difference between herself and those of her own age.

In one such case the administration of polyglandin, a preparation of mixed organic extracts, was followed by an increase of height of ⅝ inch in 14 days and another ½ inch in the next 12 weeks, but the child at the same time had improved so much in her power of assimilation that she was able to take an ordinary diet in place of the restricted special diet, so that growth might have been due to this rather than to the drug.

If we have no certain means of promoting growth in these cases where it has been arrested by the disease I suspect that we can do something to prevent the stunting by the diet adopted during the earlier and more acute stage of the disease, for I have noticed that cases fed on human milk or on asses' milk have shown much less interference with growth than those in which such feeding was not obtainable.

Anyone who has seen the remarkable stunting of growth which can be produced in rats by regulating the diet so as to exclude some elements will realise that there is no necessity, in children with this disease, to seek for the primary cause of the arrest of growth in any failure of internal secretions. Nevertheless, it is quite conceivable that the general interference with nutrition, caused by the failure of fat absorption, may affect also the internal secretions which are known to play a part in the regulation of growth.

The point is one of practical importance. For if the arrest of growth is due simply to deficiency of calcium absorption, through the loss of calcium in the soaped fat passed in the faeces, one might suppose an increase of the intake of calcium by administration of calcium salts—for instance, the lactate or the chloride—would compensate to some degree for the loss in the faeces, assuming that the wastage in the form of soap remains unaltered.

But I know of no evidence that growth is promoted by the giving of calcium in this way; I am not even satisfied that calcium salts given thus have any effect upon bone formation; certainly one's experience is that, judging from clinical evidence, calcium in the form of lime-water has little, if any, effect in the prevention or in the cure of rickets. Moreover, in some experiments upon the feeding of rats with a diet deficient in fat, the arrest of growth occurred in spite of the administration of calcium in the form of calcium lactate.

IMPORTANCE OF DIET

To sum up, it would seem that drugs, while not entirely impotent in the treatment of this condition, have a very limited scope, and that chief reliance is to be placed upon scrupulous care in dieting. The element in the food which requires most consideration is the fat, and the form of fat which seems most obnoxious to children affected with cœliac disease is the fat of cow's milk. If this be borne in mind it is nearly always possible to obtain marked improvement in these cases, and a large proportion of them can be coaxed back after many months or years of patient perseverance with a very restricted diet, to health and even to an average power of assimilation.

CONCLUSION.

In conclusion, Gentlemen, I can only regret that I have not been able to throw more light upon the obscure problems raised by this group of cases, and that the working hypothesis with which I started, that it can be pigeon-holed as one specific morbid entity, cœliac disease or intestinal infantilism, name it what you will, remains still nothing more than a working hypothesis.

I have raised many questions, I have answered few, and if any apology is needed, I would say, in the words of Heraclitus, *χρυσὸν οἱ διζήμενοι γῆν πολλὴν ὀρύσσουσι καὶ εὑρίσκουσιν ὀλίγον.*

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THE TREATMENT OF WOUNDS.

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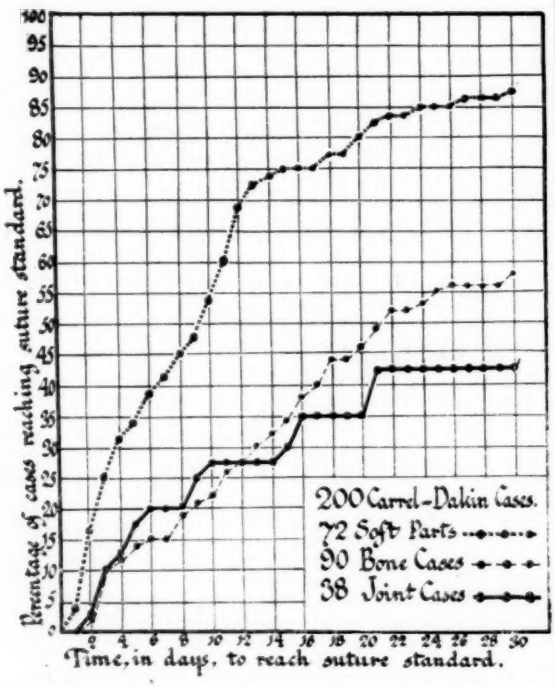
I.—THE CARREL-DAKIN TREATMENT OF WOUNDS: REVIEW OF 200 CASES.

DURING 1916 and 1917 a large number of cases were treated by the Carrel-Dakin method; detailed notes were kept, but for months at a time this was out of the question and no more than 200 form the basis of this paper. The first 100 were cases treated in a base hospital in the wards devoted to the most serious cases; the second 100 in the surgical observation hut attached to a general hospital. These last consist of severely wounded men, moribund cases being excluded. The following indicates the type of wounds dealt with:—

Wounds of soft parts, 37 per cent.
Compound fractures, 46 per cent.: Humerus, 9 per cent.; ulna and radius, 4·5 per cent.; femur, 6·5 per cent.; tibia and fibula, 11 per cent.; other bones, 15 per cent.
Wounds of joints, 17 per cent.: Shoulder, 4 per cent.; elbow, 2 per cent.; wrist, 2 per cent.; knee, 6·5 per cent.; ankle, 2·5 per cent.

Results vary greatly according to whether preliminary surgical treatment is undertaken in the pre-inflammatory period or after sepsis is established. The cases have therefore been divided into (A) those operated on within 24 hours, and (B) those without preliminary operative cleansing, or in which this was not done till at least 24 hours had elapsed. More scientific classification is impossible; cases falling into Class B are becoming fewer and fewer.


Percentage of cases reaching suture standard.
200 Carrel-Dakin Cases.
72 Soft Parts
90 Bone Cases
38 Joint Cases
Time, in days, to reach suture standard.

Results.

The combination of mechanical cleansing with progressive sterilisation by means of a chemical agent has brought about an extraordinary advance in wound treatment, and evidence will be put forward which cannot fail to convince any who have had to deal with wounds since the earlier stages of the war. The evidence consists of a careful record of 200 cases typical of the ordinary severe injuries passing through any base hospital in France. The accompanying table shows the main results:—

	A, 114 cases.	B, 86 cases.
Temp. normal	in 95·9% after 9·7 days*	in 86·3%, after 8·2 days.
Suture standard reached in	,, 82·5% ,, 12 ,,	,, 67·4% ,, 15·5 ,,
Suture performed	,, 77·5% ,, 13·6 days	,, 53·5% ,, 17 ,,
Healed before evacuation	67·5% of cases	44·2% of cases.
Average duration of treatment before healing	28·2 days	33·6 days.

Case mortality, 3%. Secondary hæmorrhage, 3%.
Secondary amputation, 3%.

* In each case after treatment for number of days indicated.

The accompanying chart is instructive inasmuch as it shows the relative speed at which wounds of soft parts, bones, and joints attained suture standard.

Such facts speak for themselves and there is no doubt that similar results can be obtained by any who are familiar with the technique and apply it faithfully.

Treatment.

Treatment has followed closely on the lines laid down by Carrel. It has been possible to treat patients from the commencement in only a few instances and accordingly reliance had to be made for the early treatment on some unknown member of the profession working in an unknown casualty clearing station. This opportunity may be taken of saying how efficient that treatment is becoming in the great bulk of cases. In a series of close on 300 over 10 per cent. reached the base in a condition enabling suture précoce to be practised at once.

The main outlines of the Carrel treatment are now well known to surgeons in France; one or two points, however, must be alluded to.

Attempts at excising a wound in which the infecting organisms have already invaded the tissues do not hasten recovery, and at the same time materially increase the risk of septicæmia. In these cases operations should be limited to such incisions as are necessary to expose freely the furthest recesses of the wound, and the removal of such tissue only as is obviously necrotic.

In the pre-inflammatory stage, however, a radical operation secures the best results. Long incisions give a better chance of seeing and removing all contaminated tissues, and when it comes to closing the wound long incisions are just as easy to suture; they should always be planned, of course, to facilitate secondary closure. Partial closure of wounds at the primary operation almost always postpones the date of complete healing.

When a case treated by the Carrel-Dakin method arrives at the base the injection of the tubes is carried on until the patient is seen by the surgeon.

If the patient is comfortable and the pulse and temperature satisfactory, we are in no hurry to change the dressings. After 48 hours at the most, however, the bandages are removed and the superficial dressing at least changed. The skin is gently cleaned with neutral sodium oleate soap solution to which 2 per cent. chloramine-T is added and then covered with strips of bandage impregnated with sterile vaseline. If at this stage the general condition is good and the wound is free from pus and sloughs visible to the naked eye, smears and cultures are made from the parts most likely to give trouble, such as bone, fascia, tendon sheaths, or deep pockets. If the smears are satisfactory—i.e., not more than one organism per field, or one diplococcus in three—the wound is sutured next morning. If, however, the wound is not up to suture standard the Carrel-Dakin treatment is continued.* The essence of this treatment is to supply to every portion of the wound surface hypochlorite solution at stated intervals and to keep the solution as long as possible in contact with the surface. In order that every portion may be reached each wound must be studied separately and the tubes chosen must be suitably perforated. Individual recesses, if important, must each have a tube, or, if unimportant, a wick of gauze or lint. The influence of gravity must be taken into account in disposal of tubes. The original petticoated tube has been almost entirely given up. Lint is used in the dressing to a large extent instead of gauze.

Operative measures are undertaken only in response to some urgent indications during the first ten days.

* The results obtained by the surgeons in Depage's clinique go to show that in the presence of streptococci early suture—suture précoce—is not justifiable. A large number of observations have been made along these lines, but they are not yet sufficiently far advanced to show just what organism it is dangerous to leave in a sutured wound; even the streptococci are not uniformly pathogenic.

Removal of foreign bodies not giving rise to acute symptoms, of small pieces of badly infected bone, and secondary operations of all kinds are done, if possible, only when local reaction is well established and, as far as may be, after the general wound surface has reached suture standard. When infected bone is not essential to the ultimate usefulness of the part a portion is freely resected, but function is never sacrificed to secure early asepsis. Of the fractures of long bones included in this series which were retained for five weeks or more 82·5 per cent. were already consolidated. After eight weeks only 5 per cent. remained ununited.

Fifty consecutive cases were treated with eusol. Two-thirds of these were A cases and one-third B cases. The results were as follows:—

Temperature normal after treatment for 10·9 days in 92 per cent.
Suture standard reached after treatment for 15·9 days in 78·1 per cent.
Suture performed after treatment for 17 days in 70·9 per cent.
Healed before evacuation, 70·9 per cent.
Average duration of treatment before healing, 30·9 days.

Injection of Solution.

The solution has been prepared according to Daufresne's modified formula and carefully standardised. It has been injected into the tubes every two hours, either by a hand syringe or from an ampoule. The hand syringe is the only method at present in use which ensures that each tube gets its full dose every time. Nevertheless, the labour saved by the ampoule is very great, and the distribution of fluid is fairly uniform if the following points are attended to:—

1. Ampoule should be suspended as vertically as possible above wound.
2. The use of Y-shaped glass junctions is preferable.
3. The main tube of a three- or four-way glass connexion should be kept as horizontal as possible. This can often be secured by safety-pin attaching it to bandage.
4. The tubes should be inspected at intervals to make certain that none are kinked.

If the solution be injected into each individual tube by a syringe the free ends of the tubes should be gathered together and closed with a clamp after injection. Two squirts and two vessels containing Dakin's solution are all that are needed. While one is being used to inject the tubes of the first patient the other stands full of solution in the second vessel, and is thus sterilised ready for next patient.

The question of heating the hypochlorite solution has always been a vexed one. Observations show that the deterioration, judged by chemical standard, is inappreciable after addition of an equal volume of hot water at 90° C. to Dakin solution 1·043 per cent. In cold weather there has never been any hesitation in using this solution warmed to body temperature by diluting, as above.

The amount of fluid used varies according to the wound and number of tubes, but an average of 10 c.cm. per tube every two hours does not lead to overflow into bed. There should be a square of mackintosh under wounded part. A useful precaution also is to have a sphagnum-moss pad applied to dependent part of wounded area outside all the bandages.

Two hours has been chosen as the routine interval between injections, and experiments undertaken confirmed this practice. However, where pus is present the renewal of the fluid every hour is advisable.

Comparison with Other Methods.

The results recorded speak for themselves, but many of the cases which on paper look like failures really represent limbs saved and function preserved. The proportion of really successful cases (that is, where secondary suture in the first 10 to 12 days permits practically of a return to normal) is higher far than that attained under any other treatment thus far tested. Definite figures can only be quoted for cases treated by hypertonic saline, flavine, and dichloramine-T in eucalyptol. These figures should be contrasted with those under the heading Carrel-Dakin B for the reason that though given surgical treatment at the front they did not receive the special treatment till after arrival at the base.

Carrel-Dakin, A	77·5%	closed by suture.
,, ,, B	53·5%	,, ,,
Dichloramine-T (in eucalyptol) ...	43·0%	,, ,,
Flavine	22%	,, ,,
Hypertonic saline	12%	,, ,,

The only other method giving results at all comparable is that of early operation and primary suture with or without the use of brilliant green, bipp, flavine, soap, or other fashionable adjuvants.

[The disadvantages were here considered.] Most of the criticisms involve no insuperable difficulty. They are questions of management, possibly self-sacrifice. The plea that the method has difficulties should not weigh for a moment when the safeguarding of life, limb, and a man's future happiness and usefulness are considered. It is not too much to say that the very least which we can do for the wounded man is nothing short of our very best.

II.—A Study of 50 Cases Treated by Dichloramine-T in Eucalyptol.

Dichloramine-T (or toluene-para-sulphondichloramide) (Dakin [5]), a substance closely related to chloramine-T and very like it in its antiseptic properties, is, however, very sparingly soluble in water and freely soluble in various oils. Thus it was hoped by means of an oily solution to provide a reservoir from which the antiseptic in the watery fluids of the wound could be maintained at an adequate concentration from one dressing till the next. Dichloramine-T, though resembling the hypochlorites in its germicidal action, differs in many other respects. Dakin showed that the chloramines have very little disintegrating effect on necrotic tissues. Further, dichloramine-T is a powerful coagulator of albumin, and even in a strength of 1–5000 precipitates some of the albumin present in serum. It was with the object of determining the value of the dichloramine-T in wound treatment that the following clinical study was undertaken.

Results of Investigation.

Persistence of the antiseptic action.—That the antiseptic passes slowly from the oily medium on to the wound surface can readily be demonstrated by the starch iodide test. A bacteriological method was also employed to throw light on this point.

Dichloramine-T 2 per cent. dressing, even if not still detectable by the available chemical tests, at least made its influence felt for about 12 hours in a lightly infected wound. Experiments on more heavily infected wounds showed less satisfactory results. In some cases the growth was quite as heavy within four hours as it had been before the application of the dressing. Nevertheless, the facts suggest that dichloramine-T in oily solution is a step in the right direction in so far as prolonged antiseptic activity on a wound surface is regarded as desirable.

In order to compare the dichloramine-T oil method with others in the actual treatment of wounds 50 consecutive cases arriving at the base with infected wounds were put under this treatment.

They were cases of gunshot wounds of varying severity; about half had bone injury. They were very closely comparable to the series of cases treated by flavine recently reported by us,[6] the results of which are here repeated for comparison, as also are those for a similar series of cases treated by the Carrel-Dakin method. It must be stated that practically every case in the flavine and dichloramine-T groups had had the benefit of early operation, followed by one or other established method of treatment—mostly bipp or Carrel-Dakin. Treatment by dichloramine-T was not started, however, till arrival at the base, anything from two to six days from infliction of wound.

Technique.—As a routine the 2 per cent. solution of dichloramine-T, as originally recommended by Dakin, was employed in this series. A stock of 12 per cent. in chlorinated eucalyptol was kept, and each day a sufficient quantity was diluted down with chlorinated paraffin. The stronger concentrations were not used, partly because it was found that the duration of the antiseptic action was not thereby materially increased, but chiefly on account of their deleterious effects as described later. The wounds were dressed daily with loose packs of lint wrung lightly out of the dichloramine-T oil, every effort being made to reach all parts of the wound surface. Where necessary the wound was further opened up to make this possible; otherwise surgical interference was restricted to a minimum, especially during the first ten days. In certain cases where there was much purulent discharge a piece of tubing was employed to renew the solution in the deepest part of the wounds every 8 or 12 hours.

Clinical results.—When judged from the standpoint of ordinary clinical experience the wounds as a whole could be described as doing well, passing fairly quickly through the usual stages. Sloughs separated and granulation of a moderately bright red colour soon appeared. Pus formation as a rule was comparatively small, and spread of infection to surrounding parts was not common. Epithelial growth at the skin margins was somewhat slow. Despite the good appearance of the wounds it was observed that many did not attain the bacteriological suture standard. In a few cases these were closed, with, however, no greater percentage of successes than is usual when wounds are closed upon clinical grounds without reference to the bacteriological control.

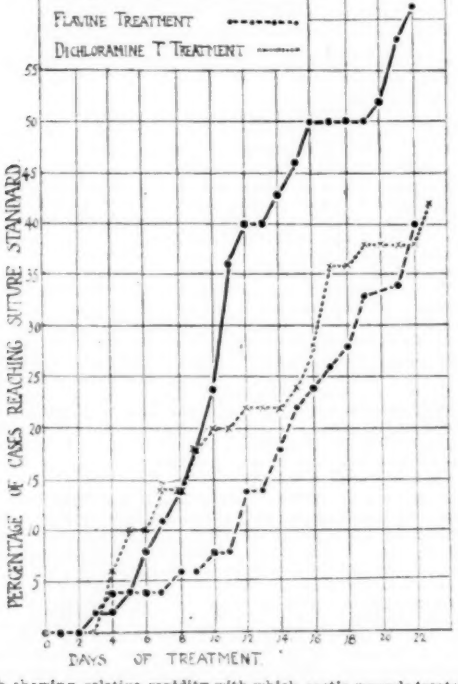
A troublesome complication which occurred very frequently was the skin irritation around the wound. In 24·5 per cent. of the cases there were œdema, redness, formation of papules, and sometimes blistering and excoriation, while in 10 per cent. the treatment had actually to be abandoned on that account. The irritation could only be controlled by diminishing the quantity used, and to a less extent by protecting the skin around by strips of bandage cloth permeated with vaseline. The authors have met certain surgeons who declare they have had little or no skin irritation from the use of dichloramine-T. These surgeons, however, have been found to use only minimal amounts of the solution, either with a spray or by dressings wrung dry before application. Experiment goes to prove that such small quantities of this antiseptic are very evanescent in their action. It has been stated lately that by the use of a chlorinated paraffin wax (chlorcosane) as a solvent for the dichloramine-T the skin irritation is greatly diminished, but as to that we have no experience.

Results Obtained by Dichloramine-T Oil, Flavine, and Carrel-Dakin Methods.

—	Dichloramine-T.	Flavine.	Carrel-Dakin.
Total	53	50	50
T. normal in...	94% after 6·4 dys.	86% after 8·8 dys.	94% after 11·7 dys.
Suture standard reached in ...	48% after 16 dys.	38% after 15·6 dys.	68% after 12·5 dys.
Sutured	44·2% after 17·2 days.	34% after 17 dys.	54% after 14·9 dys
Healed	38% after 32·4 dys.	22% after 26·5 dys.	56% after 28·6 dys.
Mortality... ...	Nil.	Nil.	Nil.
Secondary amputations ...	2%	2%	4%
Secondary hæmorrhage..	Nil.	4%	Nil.

The results obtained by dichloramine-T, though better than those in the flavine group, fell behind those in the Carrel-Dakin series. The average date at which the temperature became normal was earlier in the dichloramine-T series, but the cases in the Carrel-Dakin series, as a whole, were more serious. Several cases considered too serious for the trial of a new method were added to the Carrel-Dakin series. Yet the Carrel-Dakin series shows 20 per cent. more cases sutured and 32 per cent. more healed before evacuation than in the dichloramine-T oil series.

The relative speed at which the wounds in the various series reached suture standard will be best appreciated by the following Chart:—



Graph showing relative rapidity with which septic wounds treated by various methods reached suture standard.

Histology.—Portions of granulation tissue with the adjoining skin edge have been excised from the series both of cases that came up to suture standard rapidly and in which this was delayed or not reached. They were excised at intervals varying from 3 to 30 days, and after treatment with the different concentrations. Dichloramine-T dissolved in chlorinated paraffin eucalyptol in a concentration of 2 per cent. induces an evident reaction both on the skin and granulation tissue, which can, however, only be recognised as certainly deleterious after prolonged application. This is due either to the action of the free chlorine given off or the essential oil or to both, and occurs more rapidly and is more marked with higher concentrations. It ultimately leads to delay in the processes of healing, the ingrowth of skin epithelium becoming aborted and the formation of scar tissue irregular and imperfect. With higher concentrations these changes are exaggerated.

Conclusions.

The dichloramine-T oil method of wound treatment is simple of application, and the claim that the action of a single application is prolonged is substantiated. The results, even when judged by modern standards, are not to be disregarded.

Dichloramine-T oil is not indifferent to granulation tissue or to the skin edges of wounds, but has, especially if used for a long time, a deleterious action on both. The ingrowth of skin is retarded, and the natural tendency for granulation tissue to disorganisation is aggravated.

The use of an oily menstruum does not altogether prevent the adhesion of dressings to the surface or obviate the repeated, if minute, insult to the tissues inseparable from each dressing.

Though an improvement on some other methods in vogue, dichloramine-T oil has not yielded the improvement on Dakin's solution that was anticipated, perhaps because it is neither innocuous to healthy granulation tissue, nor a solvent of dead tissue, perhaps, possibly, because an oily application is not so efficacious as a watery solution in the treatment of wounds.

References.—1. Bashford: THE LANCET, Oct. 20th, 1917. 2. Carrel and Dehelly: Le Traitement des Plaies de la Guerre. 3. Morrison: British Journal of Surgery, iv., No. 15, 1917. 4. THE LANCET, 1918, i., 534. 5. Dakin and Dunham: Handbook of Antiseptics. 6. A Study of 50 Cases Treated by Flavine, Brit. Med. Jour., Dec. 29th, 1917.

POST-DIPHTHERITIC PARALYSIS.

NOTE ON A FORM FOLLOWING CUTANEOUS DIPHTHERIA.

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Introduction.

THE nervous sequelæ of diphtheria constitute a very characteristic symptom-complex. The initial palatal paralysis and the striking symptoms it occasions, the affection of accommodation, and the frequent polyneuritis are familiar to all clinical observers.

The mode of development and the topography of this condition are commonly regarded as dependent on a selective action of the diphtheria toxin on certain cranial nerves and their nuclei; that is, on a selective hæmatogenous toxæmia of the nervous system.

However, when experimentally produced in animals diphtheritic paralysis is not characterised by the cranial nerve involvement so typical of the condition in man, and this fact has led certain observers (C. Bolton, Crocq) to postulate specific differences in the action of the toxin in man and in animals respectively. Thus, Bolton[1] concludes—

"That in the higher mammals the poison especially attacks the medullary centres and the cranial nerves, and in the lower mammals the spinal centres and spinal nerves."

In a comparative analysis[2] of the factors concerned in the production of diphtheritic paralysis in man and animals I have sought to show that a simple physical factor—namely, the seat of toxin formation—is an adequate explanation of these apparently specific differences. For it is noteworthy that in man the structures initially, and frequently alone, paralysed are closely related anatomically to the infective focus in faucial diphtheria, not only in the matter of actual proximity, but, and as Orr and Rows[3] have shown this is far more significant, in that of innervation. For the afferent innervation of tonsils and fauces and the motor nerve-supply of the palatal muscles are both part of the glossopharyngeal-vagus-accessorius nuclear system and its peripheral nerves.

In animals a similar anatomical correspondence between the evolution of the paralysis and the site of the experimental infective lesion is seen.

Aubertin, Babonneix, and Guillain and Laroche have all drawn attention to this significant relationship between primary lesion and initial paralysis. On the other hand, several observers (Remak, Oppenheim, Bolton, and Brewer) record the absence of palatal involvement in certain cases of paralysis following extra-faucial diphtheria.

These exceptional instances, however, do not appear to have determined any change in the current view that the underlying process is a selective blood-borne intoxication of the nervous system. If this hypothesis be correct, the syndrome of diphtheritic paralysis should be independent of the site of the infective focus and relatively constant in type. If, on the other hand, as Guillain and Laroche have suggested, we are dealing with an ascending neuritic process comparable with that occurring in tetanus, the study of the nervous sequelæ of extra-faucial (wound and cutaneous) infections should reveal the anatomical relationships mentioned above, and at the same time help to elucidate the pathogenesis of diphtheritic paralysis. To an adequate appreciation of the problem a consideration of the work of Orr and Rows[2] on "lymphogenous toxi-infections of the nervous system" and that of Meyer and Ransom[3] on tetanus is an essential preliminary.

Clinical.

During the past 15 months (1917-18) there has been an unusually favourable opportunity for the clinical study of this question. A form of localised superficial cutaneous ulceration on hands, forearms, and other exposed parts known as "septic sores" has been extremely prevalent among troops in this field of operations (E.E.F.). Occurring simultaneously has been an outbreak of faucial diphtheria of a relatively mild type, but associated for reasons inseparable from active service conditions with a large proportion of nervous sequelæ of the usual character.

In these circumstances a large number of cases of polyneuritis were observed, not associated with any previous illness, and under conditions in which beri-beri, arsenic, alcohol, and other causal factors could be excluded, but definitely connected with "septic sores," infected cuts and wounds. They gave no history of sore-throat.

An analysis of a series of these cases revealed three constituent elements in the fully developed symptom-complex; a local paresis related to the infective focus, when this was not multiple, a paralysis of accommodation like that seen after faucial diphtheria, and a polyneuritis. Of these three elements, the local paralysis occurred in 27 per cent. (8) of a series of 30, the paralysis of accommodation in 33 per cent. (10), while the polyneuritis was constant.

The local phenomena were associated in 6 cases with a single infective focus, the remaining 24 of the total showed multiple "septic sores."

In the majority of the observed cases the cutaneous lesions were healed when nervous symptoms appeared, but in 6 bacteriological examination revealed in pure culture an organism morphologically and culturally indistinguishable from the Klebs-Löffler bacillus.

In one of these the source of infection was a fatal case of laryngeal diphtheria. A résumé of this particular case will stand as a fair example of the series, though in it there was no ocular defect and constitutional symptoms were unusually severe.

A medical officer in performing tracheotomy on a case of laryngeal diphtheria scratched his right thumb; a small ulcer appeared from which the diphtheria bacillus was grown. During convalescence numbness and paræsthesiæ of the right thumb, weakness and clumsiness of hand movements, and cramp in hand and forearm muscles developed, and preceded a typical polyneuritis of moderate severity. At no time were any palatal symptoms noted.

The local onset related to the infective focus was an early and prominent feature of this case.

In considering the much greater frequency of a local onset in faucial diphtheria, there must be borne in mind the much shorter course of the peripheral nerves in this instance, a factor which, as Orr and Rows have shown, largely determines the intensity of the central nervous lesion. Yet even after faucial diphtheria a certain proportion of cases of polyneuritis are seen preceded by no local phenomena.

In all over 50 cases of this type were observed, and for the following reasons, it was concluded, might confidently be regarded as post-diphtheritic:—

1. Their association as to time and place with the occurrence of faucial diphtheria.

2. The isolation with considerable frequency, by pathologists in the field and at base laboratories, of organisms morphologically and culturally indistinguishable from the Klebs-Löffler bacillus, from the type of cutaneous lesion with which these cases were unquestionably associated. In addition, their isolation in six observed cases of polyneuritis.

3. The occurrence of paralysis of accommodation as a symptom—this being peculiar to post-diphtheritic paralysis.

4. There was evidence of a time relationship between development of primary lesion and neuritis; the latter appearing from the fourth to the sixth weeks of infection in such cases as afforded indications of onset of infection.

5. The absence of any other known causal agent.

The Pathogenesis of Diphtheritic Paralysis: A Comparison with Tetanus.

The resemblances between this symptom-complex, with its three elements, and the modern conception of tetanus we owe to Meyer and Ransom will be at once apparent. The local, specific, and generalised forms of tetanus may be compared with the local, ocular, and generalised phenomena seen in these cases.

While the theory of a selective hæmatogenous intoxication may account for both generalised and ocular (specific) symptoms in post-diphtheritic paralysis, it is inadequate to explain the local phenomena with their varying incidence in faucial and extra-faucial diphtheria. The following hypothesis may therefore be put forward to account for the processes underlying the genesis of diphtheritic paralysis. This has been more fully discussed elsewhere,[1] but may be briefly resumed thus:—

The initial local paralysis is the result of a "lymphogenous" intoxication (Orr and Rows) of the nervous system, the toxin being carried from the infective focus along the perineural lymphatics to the corresponding cranial or spinal centres. In the case of faucial diphtheria the palatal musculature being innervated from the cranial nerve concerned is earliest affected.

The specific (ocular) and generalised (polyneuritic) symptoms cannot be accounted for thus, but must be due to the toxin circulating in the blood stream and thus reaching the whole nervous system, central and peripheral, simultaneously. Accommodation paralysis may be regarded as the manifestation of a selective affinity of the diphtheria toxin for certain elements of the nervous system, while the polyneuritis is the expression of the general toxæmia of the nervous system.

The analogy with tetanus does not extend to the underlying pathological processes; diphtheria toxin is not so specific in its action as is tetanus toxin, and the ascending lymphogenous process suggested here is not peculiar to diphtheria, but occurs with numerous other toxins and organisms (Homéo, Guillain, &c.).

Viewed in the light of this hypothesis, the obscurity surrounding the question of the essential nervous lesion in diphtheria largely vanishes. A pathological and experimental confirmation of this clinical hypothesis on the lines indicated in the work of Orr and Rows is clearly needed. The inconclusive results of past investigations of this nature may be traced to the absence of any clear or guiding conception of the nature of the processes involved in the production of diphtheritic paralysis.

Appendix.—At the Neurological Section of the Royal Society of Medicine on Feb. 21st, 1918, Dr. Henry Head showed a case of "toxic polyneuritis of the trenches." This man, it is recorded, was "treated for boils" at or about the onset of his nervous symptoms. It is worthy of consideration from the point of view now presented.

References.—1. C. Bolton and Bown: Brain, 1907, xxx., 365. 2. Orr and Rows: Brain, 1913-14, xxxvi., 271. 3. Ransom: THE LANCET, 1917, ii., 923. 4. Walshe: Quarterly Journ. Medicine, 1918, xi., 222. 5. Idem: Ibid., not yet published.

ROYAL FREE HOSPITAL.—A grant of £10,000 has been made to the Royal Free Hospital by the American Red Cross Commission for Great Britain for an extension of the maternity department, and it has been decided to take over and extend the maternity hospital hitherto entirely supported by the Duchess of Marlborough which at present provides for the treatment of 20 patients. It is intended, as soon as the necessary arrangements can be carried through, to provide 50 beds for maternity cases. It is also intended to extend at this centre maternity training for the nursing staff of the Royal Free Hospital and other pupils. The spirit which has animated the representatives of the American Red Cross Society in making this grant is keenly appreciated by English medicine.

THE TREATMENT OF STAPHYLOCOCCAL INFECTIONS BY STANNOXYL:

"MIXED INFECTION" OF PULMONARY TUBERCULOSIS.

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IN a previous communication [1] I gave an account of the first cases in this country of furunculosis and acne treated by the new drug stannoxyl, recently put forward by Frouin and Grégoire,[2] as a specific for staphylococcal infections. So far the employment of stannoxyl with successful results in staphylococcal infections has been recorded only for furunculosis (Frouin and Grégoire,[2] Hudelo,[3] Compton [1]), acne (Frouin,[4] Compton [1]), chronic suppuration of bone (Grégoire and Frouin [5]), traumatic osteomyelitis (Phocas [6]), suppuration in gunshot wounds (Phocas [6]).

In view of the fact that the staphylococcus is more or less constantly met with in the microbial flora constituting the "mixed infection" of pulmonary tuberculosis, it has occurred to me to test the influence of stannoxyl on this condition. The present paper deals with three clinically definite cases of phthisis so treated, a short preliminary account of which has already appeared elsewhere.[7] The stannoxyl for the investigation was kindly placed at my disposition by M. Frouin.

Broncho-pneumonia (? Tuberculous).

CASE 1.—Pte. L., aged 23, half-caste Australian aboriginal. Sent back from France on Feb. 17th, 1917, suffering from pleurisy; left side affected. Admitted to hospital at Norwich, where he stayed five weeks, from which he was sent to Dartford, where he remained eight weeks. Arrived eventually at Weymouth in May, 1917, feeling pretty well. Next comes a history of three or four days' pain in chest on right side; cough, with frothy expectoration (no blood), and a difficulty in keeping his food down. Readmitted to hospital May 29th, with the provisional diagnosis of tuberculous broncho-pneumonia. Moist sounds scattered throughout the chest, with harsh breathing at both apices. Following admission, morning temperature was 100–101° F., evening temperature 102–103°; pulse 100–140 per minute; respiration 32–40 per minute. Tepid sponging was practised throughout June to control the temperature.

First seen by me about July 10th, when, with the idea of clearing up the "mixed infection"—on the assumption that the case was tubercular, which it was clinically—and, thereby, bringing down the temperature, stannoxyl treatment was begun. Frequent examinations of sputum for T.B. were carried out over the period May 30th to August 16th; but T.B. were never found; the pneumococcus was constantly found. The bacteriological findings in regard to a specimen of sputum of July 2nd, examined by culture on serum-agar for the presence of staphylococci, were as follows: No staphylococci isolated; but colonies of three sorts of Gram-negative bacilli, one being Friedlander; also a Gram-negative diplococcus. Another specimen of sputum was examined from this point of view on August 7th, when *Staphylococcus albus* was found to be present.

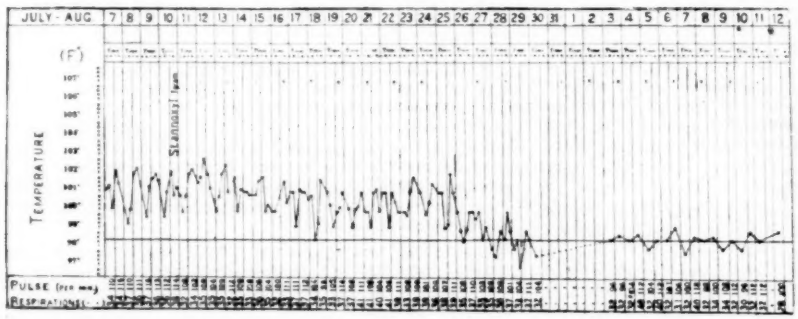
Chart 1 indicates the progress of the case from the time stannoxyl treatment began, or just a little previous to this, until the temperature became normal and remained thereafter at or about the normal level. The dotted portion of the chart between July 30th and August 3rd corresponds to a missing temperature chart, unfortunately lost during a change of hospital.

Only four stannoxyl tablets (about 1 g.) were taken per day at the commencement of treatment, and sometimes even less, as the patient was so ill, and one was uncertain what the effect of the stannoxyl might be. Indeed, on July 19th, his condition was so bad that an injection of pituitrin had to be resorted to.

Seventeen days after treatment with stannoxyl had begun the temperature fell sharply to or about normal, and remained so until his discharge from hospital on Sept. 7th to return to Australia. Although still in a weak condition at the time of his discharge his temperature, with the exception of evening rises to 100·8° recorded on three occasions, had only oscillated 0·5° on either side of the normal all through August; his pulse-rate had become on the average 94, his respirations 26; the amount of sputum expectorated had greatly diminished; his appetite had become good, and his general condition had altogether improved, the patient being able to get up and move about his ward a few hours daily.

Before his departure he was taking regularly eight tablets of stannoxyl per day.

CHART 1.



Pulmonary Tuberculosis.

CASE 2.—Private W., aged 19. Joined the Army in January, 1917. He caught a cold in February during his training in a camp at Ripon; when he had a cough and frequently spat up blood; but he did not report sick to his medical officer. The cough eventually passed off, and he arrived in France in June, 1917. He was wounded at Ypres on August 15th by a bullet in the left forearm, which necessitated amputation of the arm. He was sent to Boulogne, where he remained in hospital a few days, and was eventually transferred to Weymouth, arriving here on August 28th. He then had a cough and complained of always sweating (chiefly in the daytime). His physical signs at this time (examination Sept. 4th) were: Right lung, in front, dullness and bronchial breathing at the apex; behind, crepitations scattered all over the lung. Left lung, in front, breathing good at the apex, dullness and crepitations over lower lobe; behind, dullness, especially at the base, bronchial breathing at the level of the spine of the scapula, and coarse crepitations at the base. A specimen of sputum examined on Sept. 6th revealed the presence of T.B.

Stannoxyl treatment was begun on Sept. 8th, 4 tablets (1 g.) being taken the first day, 6 the second, and 8 per day ever since. Chart 2 gives a graphic representation of the progress of the case, showing the response to treatment.

Systematic examinations of sputa were carried out during the course of treatment, to ascertain the effect in vivo of stannoxyl on the microbial flora constituting the "mixed infection." Table I. resumes the findings.

TABLE I.

Date.	Films stained by—		Culture.
	Ziehl.	Gram.	
6/9/17	T.B.	—	—
10/9/17	,,	G. + and G. − diplococci, G. − diplobacillus.	*Staph. aureus*, streptococcus, pneumococcus, meningococcus, *M. tetragenus*.
15/9/17	—	—	Streptococcus, pneumococcus, meningococcus, *M. tetragenus*.
21/9/17	T.B.	—	Streptococcus, meningococcus, *D. flavus*, G. − cocco-bacillus.
27/9/17	,,	G. − diplococcus.	*Staph. aureus*, pneumococcus, *D. flavus*, yeast cells.
1/10/17	,,	G. + and G. − diplococci.	Streptococcus, pneumococcus, meningococcus, *D. flavus*.
5/10/17	No T.B.	Streptococcus, G. − diplococcus.	*Staph. albus*, pneumococcus, streptococcus, *D. flavus*.
7/10/17	T.B.	G. − diplococcus.	*Staph. albus*, pneumococcus, *D. flavus*, B. diphtheroid, two kinds of G. − bacilli.*
12/10/17	,,	G. + and G. − diplococci.	*Staph. albus*, streptococcus, pneumococcus, *D. flavus*, a long curved G. − bacillus.*
19/10/17	No T.B.	G. + diplococcus, pneumococcus.	Streptococcus, pneumococcus, meningococcus, *M. tetragenus*, G. − bacillus.*
25/10/17	T.B.	Pneumococcus.	*Staph. albus*, streptococcus, pneumococcus, *D. flavus*, and G. − bacillus.*
31/10/17	No T.B.	G. + diplococcus.	Streptococcus, pneumococcus, *M. tetragenus*, *D. flavus*.
12/11/17	,,	G. + and G. − diplococci.	Streptococcus, pneumococcus, *D. flavus*, *B. Friedländer*.

T.B. = T.B. found. * Not identified.
G. + = Gram-positive. G. − = Gram-negative.

During the fourth week of treatment, as Chart 2 indicates, the temperature fell to normal, and after oscillating for a fortnight more or less widely about the normal eventually ran a subnormal course for three weeks before settling down about Nov. 7th to oscillate less than 0·5° on either side of the normal. At the same time the pulse- and respiration-rates improved, the quantity of sputum became less, the appetite became very good, and the patient visibly put on flesh. The physical signs also showed improvement, as the following examination of Nov. 9th shows: Right lung, at the apex, dullness, prolonged expiration but no crepitations in front; behind, dullness, prolonged expiration, and some crepitations on deep inspiration; lower lobe, breath sounds not very clear, but no crepitations. Left lung, breathing normal.

Since Sept. 29th the patient began to get up, and that no doubt is the explanation of the rise of temperature of that date. Since Oct. 6th he has been going out every day for a short walk.

CASE 3.—Private D., aged 19. Joined the Army in November, 1916. Admitted to hospital on August 30th, 1917, complaining of "tightness in the chest and cough." For the few days following admission his morning temperature was 100–101° F., and that of the evening 102–103°; pulse-rate 88–110, and respiration-rate 22–24. Physical examination on Sept. 7th revealed marked dullness at the right base, diminished fremitus and vocal sounds, with deficient air entry. A sputum examination of Sept. 9th showed the presence of a few tubercle bacilli, while this was confirmed in a second specimen of Sept. 13th, in which more bacilli were found. On Sept. 24th there was marked dullness in the right axillary space extending from the fifth to the eighth ribs, vocal resonance and tactile fremitus were diminished, and the breath sounds were distant; the patient had profuse night-sweats.

Stannoxyl treatment, as indicated on Chart 3, was begun on Oct. 2nd, and throughout the treatment numerous bacteriological examinations of the patient's sputum were carried out to ascertain the effect of the treatment on the flora constituting his "mixed infection." Table II. indicates the findings.

Two weeks after his having been put on stannoxyl we find the temperature reduced to normal, or rather subnormal, in which region it remained more or less until his discharge from hospital on Oct. 30th. He was discharged on this date to proceed to a sanatorium, since when he has been lost to view.

In addition to the patient's temperature becoming normal under the influence of the treatment, his general condition showed almost daily improvement. His night-sweats disappeared, his sputum became markedly less, his pulse- and respiration-rates became more nearly normal, and he was rapidly putting on flesh, having gained 8 lb., as indicated on Chart 3, between Oct. 11th and 25th. He had been getting up ten days and had been taking walks outside five days previous to his discharge from hospital.

Remarks.

These three cases—one of broncho-pneumonia (? tubercular) and the other two of pulmonary tuberculosis—are of particular interest. As cases they constitute a record of the first attempt, so far as I am aware, to combat by means of stannoxyl the "mixed infection" of pulmonary tuberculosis—infection long recognised as the agent responsible for the temperature and which really kills and carries off the patient in phthisis.

In all three cases under the influence of stannoxyl treatment the temperature sooner or later fell to the region of normal; in three weeks for the first, in four weeks for the second, and in two weeks for the third. At the same time, a corresponding improvement occurred in the general condition; the pulse and respiration rates became more nearly normal, the sputum expectorated steadily became less, the appetite improved, and the patients put on flesh.

Considering, therefore, the results achieved in the above three cases, out of five which I had at my disposition for the investigation, the publication of their notes to-day seems justifiable. The other two cases, in a dying condition when first seen by me and put on stannoxyl, did not survive long enough to permit of the drug having a fair trial, their disease carrying them off within a week of the commencement of treatment. Case 1 has for the time being been lost sight of, owing to his discharge from the army and return to Australia; as also Case 3, having been discharged to a sanatorium. Case 2 is still under observation and treatment.

These therapeutic studies, and those already published on furunculosis,[1] constitute a complete confirmation of Frouin and Grégoire's original in vitro observations.[2] The more the conditions of culture in the body are anaerobic, the more the stannoxyl would appear to act by rendering the soil unfit for staphylococci to live and survive in. That is the condition met with more particularly in furunculosis. On the other hand, in the "mixed infection" of pulmonary tuberculosis the conditions of life for the staphylococci and associated microbes approach more and more aerobic conditions. At any rate, that would afford an explanation of the bacteriological findings recorded in Tables I. and II., where, although quantitative diminution in the amount of sputum occurred under the treatment, yet qualitatively the "mixed infection" remained more or less constant throughout. This is suggestive that the curative action of the stannoxyl may have been in attenuating the virulence of the microbes present.

How stannoxyl in the soil may bring about the attenuation of virulence is unknown; but certain experiments of Frouin as bearing on the question may be quoted. When metallic tin is incorporated in a nutritive medium containing alcohol, which is then inoculated with *Mycoderma aceti*, the production of acetic acid in the medium is diminished or totally hindered, although the growth of the microbe is not interfered with.[4] Also metallic vanadium or a salt of vanadium, when added to a nutritive medium inoculated

TABLE II.

Date.	Films stained by—		Culture.
	Ziehl.	Gram.	
9/9/17	T.B.	—	—
13/9/17	,,	—	—
6/10/17	,,	Pneumococcus, G. – and G. + diplococci.	*Staph. albus*, streptococcus, pneumococcus, *B. proteus*, B. diphtheroid, G. – coccobacillus.
7/10/17	,,	Pneumococcus, G. + diplococcus.	*Staph. albus*, streptococcus, pneumococcus, G. – bacillus producing a pink-brown pigment.
10/10/17	,,	Pneumococcus, G. – diplococcus, G. – coccobacillus.	—
18/10/17	No T.B.	—	Pneumococcus, B. diphtheroid and G. – bacillus producing a pink-brown pigment.
26/10/17	,,	Pneumococcus, G. + diplococcus.	*Staph. albus*, streptococcus, pneumococcus, *M. tetragenus*, and G. – bacillus producing a pink-brown pigment.

CHART 2.

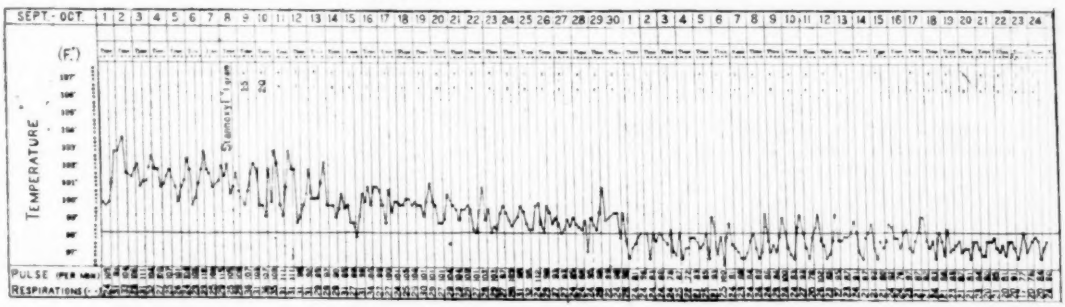
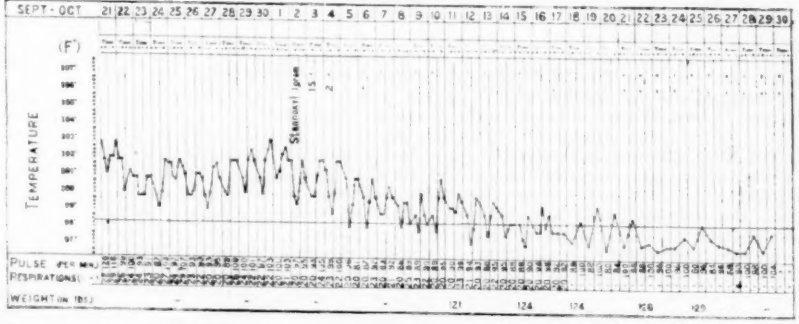


CHART 3.



with *B. pyocyaneus*, favours the development of the microbe while hindering the production of pigment.[8] These experiments permit one to suppose that the attenuation of virulence is possibly due to some reaction akin to that which electrolytes play generally in activating and in inactivating enzymic activities.[9] The question is both an interesting and important one, opening up, as it does, new vistas of research.

I wish to express my thanks to Lieutenant-Colonel E. Carroll, I.M.S., Captain K. B. Clarke, R.A.M.C. (T.), Dr. James Miller, and Dr. S. Penny Snook for kindly placing the above patients at my disposal for the purpose of this investigation.

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BLOOD-PRESSURE MEASUREMENTS:

USES AND LIMITATIONS IN MODERN MEDICINE.*

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THIS review confines itself necessarily to a limited number of points in the broad field covered by the title—points which appear to be specially worth consideration by the practitioner because they are clinically valuable and insufficiently recognised or because they are widely talked about and over-rated.

Technic.

Blood-pressure technic has become fairly well standardised and its use practically universal. It is still well to insist, however, upon the necessity of using a cuff 12 cm. wide, a mercury column for pressure gauge or one of the spring instruments which is checked up from time to time against mercury, the securing of mental and muscular relaxation by the patient when measurements are taken, and the use of the simplest indices for locating systolic and diastolic reading points. The exact relation of clinical readings, both systolic and diastolic, to the true blood pressure is still a matter of academic interest and discussion, but the important thing clinically is very simple—merely the establishing of definite normal standards and the interpretation of figures within or without these limits accordingly. So long as our technic gives results with a fairly uniform relation to the true pressure clinical demands are met, and the test of a good index is its ability to give constant results.

Normal standards for systolic pressure have long been established according to the simple palpatory technic, and I fail to see justification for the recent tendency to resort to more complicated methods. The oscillatory method, still used with some of the graphic instruments like Erlanger's and with spring instruments like the Tycos and von Recklinghausen and by some even with mercury manometers, and still referred to by certain writers as the standard of accuracy, I have shown to be particularly untrustworthy in clinical work.[1] The auscultatory method, as shown by Berkley, Rowe, Stabler, and myself,[2] gives results most of the time which are just about as good as those of simple palpation; but not very infrequently there are cases in which the arterial sounds are far from clear, and occasionally those in which auscultatory readings are definitely lower than those made with the finger. Published recognition of this long-observed fact has recently appeared in an article by Taussig and Cook.[3] As shown in Fig. 1, auscultatory readings are usually higher by 5 to 15 mm. Hg than palpatory readings, and for this reason the feeling has gained ground that auscultatory readings are nearer the true blood pressure. As already indicated, however, it is not the absolute truth of the readings which is of clinical value but only definiteness and constancy in the relation of the readings to the true pressure; so that even if the supposition about increased absolute accuracy of the auscultatory readings were true, it would not mean that they are superior for clinical use. As a matter of fact, however, it is probable that the auscultatory readings are actually farther from the truth than the palpatory readings, since in the reported experiments in which palpatory readings were compared with actual intra-arterial pressure in human subjects the former were found to be too high (4 5). For this reason, as well as for simplicity and convenience, the palpatory systolic method is prescribed for use by interns and students in the University of California Hospital.

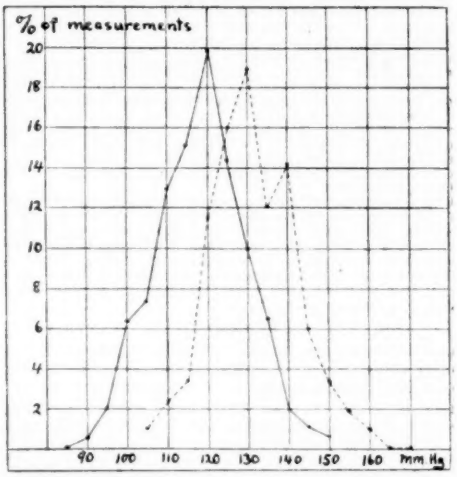

FIG. 1.—Systolic measurements of normal young men. Solid line shows result of 915 palpatory determinations on 314 individuals; dotted line 908 auscultatory measurements on 186 individuals. Recumbent position. Ages 16 to 36 years, mostly 17 to 19 years.

Diastolic readings are best made by the auscultatory method, the "change of sound," or fourth phase, being used when it is clearly marked, otherwise the disappearance of sounds. Which point most nearly corresponds to true diastolic pressure is still a matter of dispute, but is not of great clinical importance. Record is made of the criterion used, and in comparing cases it is understood that the change of sound represents a point usually 5 to 10 mm. of mercury higher in relation to the diastolic pressure than the disappearance of sounds.

Practical Applications.

The practical applications of blood-pressure measurements are few in comparison with the number and size of the volumes written on the subject. Certain associations are of the greatest importance, particularly that of high pressure with nephritis, pregnancy toxæmias, and acute cerebral pressure; and abnormally low pressure with Addison's disease.

Since myocarditis, cachexia, and other conditions responsible for low pressure are as a rule outspoken, a decidedly subnormal pressure is of great value in the diagnosis of Addison's disease. The lower limit of normal systolic pressure, however, as indicated in the books, is as a rule too high. Thus the lower limits of normal for young adults, according to Janeway, is 100, to Wiggers 100, to Norris 103, and to Goodman 120. Fig. 1 shows the results of systolic pressure measurements of healthy young adults taken during the course of medical examinations for admission to the State university. It is in substantial agreement with the results obtained by Lee[6] at Harvard University, and shows that while with the palpatory method the majority are within the commonly assigned limits of normal, a not inconsiderable number are below 100, and an occasional one as low as 85 or 90.

The upper limit of normal systolic pressure also needs a little more elasticity than is usually given to it in the books, especially if the auscultatory method is used. Fig. 1 shows that in a considerable proportion of healthy young men under the conditions of a first examination, at least, the auscultatory systolic pressure is above 140 and occasionally considerably higher. By the palpatory method only 2 per cent. are as high as 145 to 150. It should be stated that the men who showed these high figures were followed until we

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were satisfied that they were normal; and the extreme figures shown in Fig. 1 would not appear if first measurements were excluded.

Even after ruling out high figures due to excitement, &c., the diagnostic significance of hypertension is frequently in doubt between nephritis, arterio-sclerosis, and so-called "idiopathic hypertension." The diagnosis "idiopathic hypertension" or "hyperpiesis" will have at times to be made; but if the pressure is sustained at a high level—180 mm. of mercury and over—the chances are great that kidney lesions are present. Almost all autopsies of individuals who have carried habitually a pressure of 200 mm. Hg or over show renal changes (Lee[7]), though at times it is problematic how far these changes are chargeable as causes. Many are undoubtedly minor incidents in widespread arterial disease. The importance of blood pressure to the obstetrician and the brain surgeon is well recognised and need not be discussed here.

The peculiar 'increase of leg over arm' systolic measurements when the patient is horizontal and the increase in pulse pressure are at times of considerable value as confirmatory evidence in the diagnosis of doubtful cases of aortic insufficiency. They are also useful in estimating the extent of aortic valve damage.

A valuable and little known use of the blood-pressure apparatus is found in the recognition of pulsus alternans, which for prognosis is the most important and, at the same time, the most easily overlooked form of cardiac irregularity. In such cases, at times even those difficult to recognise by other means, it is simple to adjust the cuff pressure between that of the large beats and the alternate smaller ones, so that only every other pulse sound is heard.

In these instances blood-pressure determinations are of great positive value in clinical medicine, playing as they do an essential part in diagnosis, and also helping in prognosis and treatment. Their value is tremendously enhanced by the fact that in the earlier stages of arterial and renal disease hypertension is often the only sign of trouble. And when to this is added the extreme simplicity and definiteness in making the observations as contrasted with the uncertainty of blood-pressure guesses from feeling the pulse, the importance of the sphygmomanometer is seen to be very great.

A sharp distinction should be drawn, however, between the few conditions already mentioned and the many others in which blood pressure is of distinctly minor or negligible importance, notwithstanding the amount of writing on the subject. Many facts have been contributed concerning blood pressure in a large number of conditions—tuberculosis and many other fevers, ductless gland disorders, nervous and mental diseases; blood-pressure in high altitudes, in the tropics, in various races, &c.; but while many of these researches have academic interest, little of positive clinical value has come from them. Blood-pressure findings which have been supposed to be characteristic of this or that disease have too many exceptions or tend to show the characteristic changes only in the advanced cases when other clinical features are distinctive.

Blood Pressure in Functional Diagnosis.

The hopes that blood pressure would be a reliable functional index, and therefore a guide in the treatment of febrile and other circulatory disorders, have mostly met with disappointment. And the disappointment might have been predicted if the significance of blood pressure had been more clearly recognised. The rate of blood flow, the number of cubic centimetres per minute passing through the capillary system, is the thing which determines the efficiency of the circulation, and this may undergo extensive changes without any corresponding alteration of pressure, at least of systolic pressure. The reason for this is that one of the factors (increased heart output) making for increased rate of flow also elevates the pressure, while the other (vaso-dilatation) tends to lower pressure. So that, while it is often true that heart failure is accompanied by a reduction of blood pressure from a previously normal or elevated level, it also frequently happens that, together with a weak heart contraction and small output, there is enough peripheral obstruction to keep the pressure high. It is not unusual even to see moderately high pressure, when a patient enters the hospital with cardiac decompensation, changed to normal pressure with improvement of the circulation.

In fevers, particularly typhoid fever and pneumonia, little practical value has resulted from the many efforts to interpret the condition of the circulation from blood-pressure readings. For several years at the University Hospital we have undertaken a continuous study of these cases, systolic and diastolic-pressure readings being made every four hours, the same as the pulse and temperature records, but so far it is not possible to say that these pressure determinations have proved of much value in the conduct of the cases. Gibson's rule[10] in the prognosis of pneumonia has attracted much attention, and several investigators have confirmed Gibson's statement that "a pressure appreciably below the normal in pneumonia is invariably of evil omen, and any considerable fall bodes disaster. When the arterial pressure, expressed in mm. Hg, does not fall below the pulse rate expressed in beats per minute, the fact may be taken as of excellent augury, while the converse is equally true." Our experience, however, is that, while Gibson's rule may be true in many desperate cases, where the prognosis would be very guarded anyway, in the more doubtful cases it is of no particular value, as the unfavourable picture, according to Gibson, will not develop until an hour or so before death. Newburgh and Minot[11] recently have come to similar conclusions.

Diastolic Pressure.

My remarks so far have related mainly to systolic pressure. Increasing interest in the last few years has been taken in diastolic and pulse pressures. Some have thought diastolic pressure a better index than systolic pressure of what is normal or abnormal, for the reason that it is nearer the mean pressure and in a given case is usually more stable and less affected by excitement or other accidental disturbing influences. To my mind, however, this advantage, if it be such, is offset by the greater uncertainty which we[2] have found to be connected with the diastolic readings. Moreover, after a considerable number of researches on the subject there is still lack of agreement as to which auscultatory phenomenon indicates diastolic pressure, the change from a loud to a dull tone or the final disappearance of arterial sounds. In most of these studies the standard for comparison was the oscillatory method, which, as already indicated, is highly unreliable itself. The two criteria, though usually 5 to 10 mm. apart, have no constant relation, and may differ by a large amount or by practically nothing.[2] And if one attempts to confine himself to either index, many cases will be encountered in which it is anything but clear cut.

These facts argue rather strongly for retaining systolic pressure, with its long-established normal standards, as the most important blood-pressure determination. The diastolic

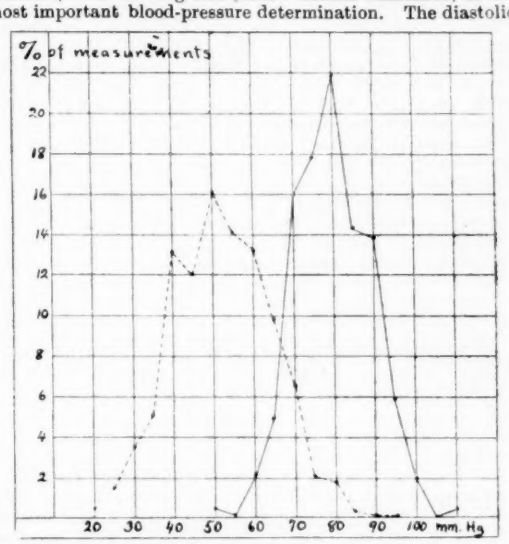

FIG. 2.—Diastolic and pulse pressure measurements of normal young men. Solid line shows results of 542 diastolic determinations (change of sound criterion) on 183 individuals; dotted line 720 measurements of pulse pressure on 177 individuals (difference between auscultatory systolic readings and "change of sound" diastolic readings). Recumbent position. Ages 16 to 36 years, mostly 17 to 19 years.

pressure as found in a series of normal young men entering college is shown in Fig. 2. It will be seen that the absolute range of variation among these measurements is practically

as great as among the systolic measurements shown in Fig. 1, so that relatively the dispersion among the diastolic measurements is greater.

Pulse Pressure.

The same considerations naturally speak for conservatism in the use of pulse pressure; for, being the difference between systolic and diastolic pressures, its error is a composite of the errors from both of these readings. So that before making any attempt to interpret pulse pressure, in the absence of a large series of concordant readings, we should discount deviations probably up to at least 10 or 15 mm. of mercury.

But even after liberal allowances for observational errors the field is by no means clear for making pulse pressure the basis for unrestricted deductions about the behaviour of the circulatory organs. The temptation to use pulse pressure in this way is natural enough and has often been yielded to. Indeed, on theoretic grounds such attempts are quite justifiable. Thus, many years ago Strassburger[12] claimed that the quotient of pulse pressure divided by systolic pressure was of value in showing the part played by cardiac work and also vascular resistance. According to him, if the quotient remains unchanged increase in systolic pressure means increased heart work, and vice versa; while increase in systolic pressure with an approximately equal fall in the quotient means increased vaso-motor tonus. In a similar way Fuerst and Soetbeer[12] suggest the use of a modified Strassburger formula, viz.:—

$$\frac{\text{pulse pressure}}{\text{diastolic pressure} + 1/3 \text{ pulse pressure}}.$$

In 1904 Erlanger and Hooker,[13] and in 1906 von Recklinghausen,[14] proposed the product of pulse pressure multiplied by pulse rate as an index of the rate of blood flow, and hence of heart activity. Three years ago Barach[15] suggested the use of a so-called "energy index" to indicate the expense of cardio-vascular energy. He multiplies the pulse rate by the systolic pressure and by the diastolic pressure, and adds the products to obtain the index (S.D.R. index). Stone[16] excited considerable interest in this country by proposing to use the quotient of pulse pressure divided by diastolic pressure as an index of so-called "heart load." Later he modified his claims for this formula.[17]

It is impossible here to go into the theoretical merits of these propositions, but from the standpoint of clinical applicability the following two criticisms may be made which apply to all of them: First, pulse-pressure measurements, as already mentioned, are subject to considerable error under the best conditions; and, secondly, several factors affect pulse pressure beside the thing usually sought after—namely, the amount of blood ejected from the heart. Vaso-constriction and dilatation have a considerable effect even when confined to the area at which the examination is made, for, as Klemperer showed, a marked difference in pulse pressure between the right and left arm of the same subject can be obtained by heating one arm and cooling the other. Of course, generalised arterial changes will alter pulse pressure, and, as already mentioned, Strassburger attempted to judge the condition of the arteries from the pulse pressure. Moreover, normal arteries in a normal state of tone have quite different degrees of distensibility when subjected to different grades of internal pressure; and this results, of course, in different pulse pressures. And the problem is further complicated by the fact that these three variables do not necessarily vary proportionally to each other. Add to these facts the further consideration that on the cardiac side volume output is not the only factor to influence pulse pressure, but that very slight differences in ejection-time may, through its effect on the inertia of the pulse wave, have a great influence on pulse pressure, and it will be seen that pulse pressure is a very complicated quantity, and that its exact interpretation would be difficult even if its determination were a matter of great accuracy. Fig. 2 shows the wide range of pulse pressures obtained in the examination of healthy young men. In Fig. 3 is shown the distribution of the same measurements after each pulse pressure is divided by the corresponding diastolic pressure—i.e., this figure represents the variations among normals of "heart load" according to Stone's formula. The dispersion is still great. The various other relations of pulse pressure to systolic and diastolic pressures have not been worked out in these cases; but it is evident that any set of ratios constructed from these figures would show great variation.

It appears justifiable, therefore, to regard with scepticism any formula which proposes in terms of any moderate alterations of pulse pressure to classify clinical cases as normal or abnormal. And even in following the progress in a given case, as, for example, a case of internal concealed hæmorrhage (Wiggers[18]), much caution must be exercised.

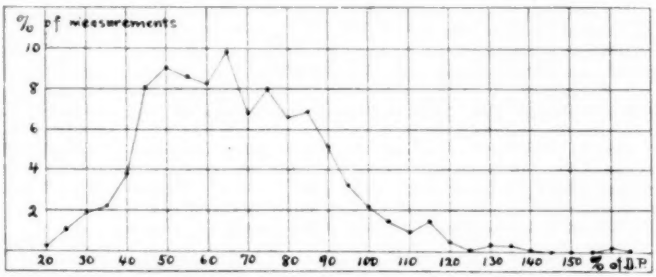

FIG. 3.—Pulse pressure in relation to diastolic pressure. Same measurements as shown in Fig. 2, but here in each case the pulse pressure is expressed as a percentage of the corresponding diastolic determination (change of sound).

Another attempt to gauge heart efficiency with the blood-pressure apparatus was the method described in 1910 by Goodman and Howell.[19] With falling cuff pressure the so-called "tone phases" were auscultated below the cuff, and the second and third phases (the murmur and the following clear sound) were considered to be related to heart strength, and the first and fourth phases to heart weakness. Normally they considered that the sum of second and third phases should be about 75 per cent. of the total pulse pressure. Fig. 4 shows large variations above and below this amount obtained in observations on normal young men.

In addition to these attempts to utilise blood-pressure readings in functional diagnosis several functional heart tests have been proposed which involve, among other observations, measurements of blood-pressure responses to exercise or other manœuvres. It is impossible here to discuss these tests further than to suggest that their failure to come into more general use will probably be found to be due to the fact

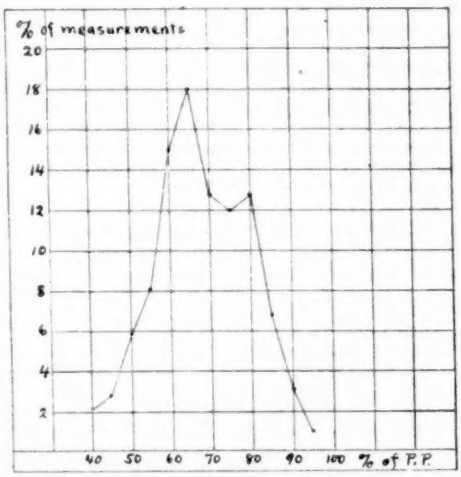

FIG. 4.—"Tone phases." In each case the sum of second and third auscultatory "tone phases" is divided by the pulse pressure, and these quotients are charted as percentages of the pulse pressure. Based on 221 observations on 104 normal young men from 16 to 36 years of age. Subjects recumbent.

that the responses of normal subjects vary considerably and overlap the results which are supposed to indicate heart weakness. And it is doubtful if such tests of the circulation will ever compare in value with a careful history and physical examination, including due consideration of the patient's own sensations after exercise.

Summary.

Experience has shown great practical clinical value of blood-pressure measurements in connexion with a limited number of conditions—namely, arterial and renal diseases, cerebral pressure, pregnancy toxæmias, Addison's disease, and, to less extent, aortic insufficiency. Before attributing pathological significance to the measurements, however, wider normal limits (both systolic and diastolic) should be recognised than those generally indicated in the books. Figures from normal young adults are presented in substantiation of this statement. An important and little-known application of the blood-pressure apparatus is its use in the detection of pulsus alternans. It is urged that systolic pressure be retained as the most important measurement, and that the simple palpatory technic be used.

Blood-pressure determinations in general have fallen short as clinical indicators of circulatory function. Pulse pressure, and consequently the various formulas in which it is involved, depends upon too many factors to be a very useful index for any of them. Great variation is shown among pulse-pressure measurements of normal persons. The same criticism is shown to be applicable in the case of the auscultatory "tone phases."

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FIVE CASES OF RAPID DECEASE IN YOUNG MEN.

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THE five cases described below appear of sufficient interest to publish, partly because of the clinical and pathological details which they individually supply, and partly because of certain accidental features which, notwithstanding essential differences, justify their collection in a group. Their occurrence in comparatively young men in rapid succession—they were admitted to the Connaught Hospital, Aldershot, within one week—is also of interest.

CASE 1.—Pte. F. R., aged 26, was admitted as a case of bronchitis on account of "dyspnœa." No history was forthcoming save that he was said to have been ill for several days. Interrogation was impossible owing to the patient's extreme deafness; he was a sufferer from chronic otitis media. The "dyspnœa" in question was soon recognised to be air hunger, and a provisional diagnosis of uræmia was made, partly upon this feature and partly upon the condition of a heart clearly hypertrophied to the left without showing cardiac disease of any kind. No urine was obtained. The blood pressure was not taken. The patient suddenly and unexpectedly collapsed and died within two hours of admission.

Post-mortem.—The kidneys exhibited very little renal substance and were obviously in a state of chronic interstitial nephritis, the weight of the pair being 4½ oz. The heart weighed 18½ oz., and except for great hypertrophy of the left ventricle was normal.

No history of antecedent renal disease was ever obtainable, but the presence of a chronic otitis media suggested the possibility of scarlet fever in childhood.

CASE 2.—Pte. S., aged 30, was admitted the following day, very livid and in a condition of extreme respiratory distress. The dyspnœa being identified as "air hunger" by the medical officer who had been in charge of the previous case, a diagnosis of uræmia was made (with precocious confidence), more especially as the left ventricle was much hypertrophied and the maximum systolic blood pressure was 180 mm. Again no urine was forthcoming, and the patient was far too exhausted to give the history of this or any previous illness. It was, however, noted that the temperature was 103° and that a distinct cardiac diastolic murmur was present. Owing to the patient's intense distress careful examination was impossible. Venesection was at once performed. Death occurred just 35 minutes after admission.

Post-mortem.—The kidneys were found healthy in size and structure. The heart was much hypertrophied, especially the left ventricle; weight 18 oz. The free edges of the aortic cusps were greatly thickened but not ulcerated; the mitral valve showed an extreme degree of button-hole stenosis. The lungs exhibited an early stage of red hepatisation.

This pair of cases seem to us to be an excellent example of two familiar fallacies. The first is the traditional expectation of encountering a second example of some relatively rare condition very shortly after one has appeared. The second is that of diagnosing a case on a general superficial resemblance to something one has recently seen. No amount of persuasion to the contrary will destroy the inclination to rely on a supposed tendency of rarities to run in couples and trios; and although teachers of medicine are perpetually pointing out the folly embodied in the second fallacy, no amount of experience appears to render one immune thereto.

CASE 3.—Pte. K., a German prisoner, aged 32, admitted intensely cyanosed and dyspnœic. T. 104°. There was a history of a recent illness of a few days' duration. Very few signs were present in the chest. Venesection was performed. Death occurred within 12 hours of admission.

Post-mortem.—The lungs showed acute general bronchitis and congestion. The other viscera were congested, but exhibited no obvious morbid change, save that scattered areas of early necrosis in the liver were visible. A pure culture of a streptococcus was obtained from the lung; culture from the spleen was negative.

Death in this case appeared to be due to a primary streptococcal toxæmia or septicæmia.

CASE 4.—Pte. M., aged 29, admitted collapsed and pallid with a history of frequent copious hæmatemeses. At the time no history of antecedent illness was obtainable, but subsequently it was ascertained that about six months previously hæmoptysis (? hæmatemesis) had occurred. On account of the patient's profound collapse a very incomplete examination was made. Death occurred eight hours after admission, the patient developing coma for the last six hours. In all probability the morphia administered contributed substantially to this state.

Post-mortem.—The dominant feature was a large spleen—30 oz., exhibiting subcapsular hæmorrhages. The stomach showed submucous hæmorrhages, mainly on the lesser curvature. The intestines contained blood from the ileum onwards. The liver was small and studded with numerous yellow umbilicated nodules of varying size. These were shown afterwards to be composed of fibrous tissue, with a peri-lobular distribution. The blood (examined post mortem) contained no myelocytes. A section of the spleen demonstrated the presence of nucleated red cells.

Diagnosis, splenic anæmia.

CASE 5.—Corporal H., admitted as influenza among a large number of apparently similar cases. Routine examination discovered great impairment of the right base, evidently due to presence of fluid. On exploration a syringeful of perfectly clear *colourless* fluid was extracted. This peculiarity, coupled with the feature that the patient was a New Zealander, led to an immediate diagnosis of hydatid of the lung. On examination of this fluid, however, no hooklets were found. On the following day the patient's respiratory distress was very much increased. The heart was pushed over to the left and the presence of a pneumothorax with most typical signs was unmistakable. Death occurred suddenly 24 hours after admission.

Post-mortem.—The right lung was found to be collapsed. On incision the whole of the middle lobe was seen to be occupied by a cyst, which on removal left a cavity 7 cm. in diameter. The lining wall of the cyst was extracted intact without difficulty. The cyst had pointed on the anterior surface, where pulmonary tissue was represented by nothing more than the external wall of the cyst. There was no evidence of daughter cysts. The lining membrane on incision was found to be a unilocular cyst containing some slightly stained turbid fluid. The wall was everywhere covered with granular bodies, shown microscopically to be scolices of *Tænia echinococcus*, both invaginated and extruded. The liver was carefully examined, but there was no evidence of other cysts either in this viscus or elsewhere.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF HYPOADRENIA SIMULATING INTESTINAL OBSTRUCTION.

BY H. M. RASHBROOK, M.B., B.S. LOND.,
MAJOR, R.A.M.C. (T.C.);
AND
F. W. CARTER, M.B., CH.B. ABERD.

THE difficulties of diagnosis of adrenal disease without the characteristic Addisonian syndrome are well recognised, and a typical case having come under our care it has been thought worth while to record it.

A soldier, aged 19, first came under the care of one of us in August, 1915, with a typical attack of acute appendicitis; appendix with gangrenous tip removed; uninterrupted recovery. Patient was re-admitted to hospital on Nov. 29th, 1917, and stated that on rejoining his unit after his last illness he had an attack of faintness on a march and was again in hospital for six weeks. Since then he had been subject to periodic attacks of abdominal pain and vomiting, accompanied by constipation. Pain usually was in epigastric region; occasionally radiated into right iliac fossa. The attacks had necessitated his being invalided from the service.

His illness when seen for the second time had started seven hours previously. On admission pale and collapsed; epigastric pain. Vomiting was present, at first bilious, later developing a somewhat fæcal odour. Constipation extending over previous day or two was also admitted by patient. T. 95° F., P. 110. Palpation of abdomen elicited tenderness in epigastrium and in right iliac fossa radiating from old operation scar downwards and inwards. A provisional diagnosis of intestinal obstruction due to adhesions from former attack of appendicitis was made.

The collapse was treated by rest, warmth, and stimulants. An enema gave a good though constipated result, and the general condition greatly improved. Vomiting ceased, though local pain and tenderness remained. The pulse also became less rapid and stronger, but still did not become quite normal in force.

In a day or two patient felt quite well except for feeling of fatigue on exertion. He was allowed up for a little each day and seemed to suffer no inconvenience, but retained to some extent a pinched and cold appearance. The bowels were kept moved regularly by administration of liquid paraffin each evening. Beyond slight diminution of percussion note and few fine crepitations at apices of lungs in front a general physical examination revealed no signs of organic disease. Examination of sputum for tubercle bacillus negative.

On Dec. 6th, another attack of abdominal pain with repetition of previous vomiting occurred. At this time it was noticed that deep palpation over abdominal scar produced a feeling of nausea. Same treatment as during previous attack; recovery equally rapid and marked. It was then decided to explore the abdomen, but it was not until the end of December, when the general condition had improved, that this procedure was considered advisable.

On Jan. 5th, two days before date of proposed operation, a third attack developed. The abdominal pain recurred; vomiting not so prominent as previously. Marked syncopal symptoms with great dilatation of pupils were also present. Patient's general condition became worse; death occurred same evening.

On account of our inability to understand the sudden termination of the case, permission was obtained for a partial post-mortem examination.

The abnormal findings in a routine examination of the abdominal and thoracic viscera were as follows:—

Pleura.—A few fibrous adhesions at right apex. *Lungs.*—In right apex a small fibro-caseous patch with some calcification about size of two-shilling piece. *Heart.*—Free margin of mitral valve showed fringe of organised granulations; valve appeared healthy.

Stomach.—Somewhat dilated; musculature thinned. *Large intestine.*—Few adhesions between lower end of cæcum and parietal peritoneum; not such as could cause any obstruction. A small healed dimple marked site of appendix. *Mesentery.*—Glands throughout palpable.

Kidneys and suprarenals.—Considerable fibrosis of perirenal structures, particularly in upper part; careful dissection was necessary to separate suprarenals from surrounding tissues. The adrenals were not altered in shape or increased in size. On section both were found to be the seat of caseous degeneration with a few scattered calcareous particles.

The mesenteric glands and adrenals were sectioned. Microscopic examination of glands showed only small round-celled infiltration. Sections of suprarenal bodies showed that for the most part the glandular cells had been replaced by degenerated caseous masses, but outside these giant-cell systems could be clearly distinguished. In a few places the cells composing cortex of glands could still be defined, but even these for the most part showed cloudy swelling and irregular staining.

Langlois, Gourfein, and others have demonstrated by animal experiments that ten-elevenths of the suprarenal bodies can be destroyed without the general body metabolism being so disorganised as to cause death. In the case here noted the adrenal destruction seems to have reached a very considerable degree before the final issue occurred. Lewin points out from an analysis of published cases that in 28 per cent. no pigmentation occurred. At the present time the exact cause of the pigmentary changes in Addison's disease does not seem to have been ascertained with any degree of certainty. In this case we suggest that it may possibly be due to the fact that not sufficient time elapsed between onset of disease and patient's death to allow it to occur.

Ebstein and Zaudy have recorded the occurrence of cases of suprarenal disease with predominant abdominal symptoms, but we have not be able to ascertain the frequency with which they occur. Owing to the previous abdominal history and the symptoms of partial obstruction which responded to the usual methods of treatment the probabilities seemed to point to the clinical diagnosis made. It was not until the post-mortem examination revealed disease of the suprarenal capsules that the symptoms here recorded were viewed in their proper perspective and recognised as another clinical entity—namely, hypoadrenia.

A DEVICE FOR PREVENTION AND TREATMENT OF ADENOIDS.

BY ISABEL ORMISTON, M.B.,
MEDICAL INSPECTOR OF SCHOOLS, TASMANIA.

WHEN in 1914 a non-operative method of treating adenoids, discovered by Mrs. E. Handcock, was brought under my notice, I was not merely sceptical, but openly scoffed at the idea. I was bound to admit, however, that after two years' residence in a children's hospital and three years' medical inspection of school children I was not satisfied with the results of the usual operative treatment; as such a large percentage of cases remained mouth-breathers and continued to suffer from nasal catarrh. In many cases also the growth returned.

Description of Method.

This new treatment consists in the production of a sneeze by lightly touching the nasal septum near the tip of the nose with a slightly irritant adhesive powder, made from powdered iris root and soap. The powder is not sniffed up into the nose.

The effect of the sneeze is to expel the catarrh or muco-pus from the nose and the adjacent sinuses. This stimulation should be repeated till a "dry" sneeze results. The free flow of lymph which accompanies the sneeze acts as a most efficient washout, and no doubt acts, too, as a natural protective fluid against the bacterial invasion present in adenoids.

The children who are old enough to blow their noses are then taught a handkerchief drill. They stand in line, and at the word of command they grasp the bridge of the nose and raise the elbow to the height of the shoulder, and then blow forcibly. The position of the elbow automatically expands the lungs and ensures a strong current of air being forced through the nose, which is held at the bridge to prevent pinching of the nostrils.

Results.

Under the supervision of Dr. Octavia Lewin an experimental clinic of this nature has been in existence for six months at the Roll of Honour Hospital for Children, Harrow-road. The committee is so satisfied with the results that it is to be continued as part of the hospital routine.

I have been observing this simple method of treatment for the past four years and have found the results most gratifying. The first marked improvement is curiously enough in the digestive system. The dyspepsia and constipation, which are so common an accompaniment of adenoids, are the first symptoms to disappear. Perhaps some student of reflex action could explain this. We know that the nose is an early indicator of indigestion, alcoholism, and gout; so perhaps it is not surprising if the digestive system can be reflexly affected by a nasal stimulus.

Deafness due to the blocking of the Eustachian tube also disappears quickly.

The time taken for the shrinkage of the growth varies. Generally speaking, the younger the child the quicker the results. A great deal depends on the intelligence of the mother, as the treatment must be carried out every day. In older children and adults with nasal obstruction a certain amount of manipulation of the head and neck is necessary to stimulate the lymphatic circulation.

One of the chief advantages of this form of treatment is that large numbers of school children should be treated simultaneously at little cost. School nurses could be quickly trained to carry out the treatment under the supervision of the medical inspectors of schools. At the present, when, owing to the shortage of staff, the out-patients' departments of the various hospitals find it impossible to cope with the number of cases from the board schools, it seems the ideal moment to introduce the system into our schools.

A clinic has lately been started at the Westminster Health Association, Greek-street, Soho, where the enthusiasm of the mothers over the improvement in their children is most encouraging.

Illustrative Cases.

The following are notes referring to a few of the cases treated:—

CASE 1.—Male aged 3½. Seen April, 1913. Difficulty in breathing; slept with mouth open; slightly deaf; one eye squinted slightly; frequently constipated; distended abdomen. Out-patient for two years at Royal Free Hospital and afterwards at Great Ormond-street. In April was taken to Central London Nose, Throat, and Ear Hospital, where operation for adenoids was advised. He was then treated by the above method for three months, and treatment was kept up for another three months by the mother at home. In August, 1913, the father wrote as follows: "Our boy is in splendid health. Eyes are straight; deafness gone. Sleeps well with closed mouth, and has grown considerably in height and increased in weight."

CASE 2.—Male aged 10. Suffering from asthma and adenoids. This boy was in such a generally weakened state that the medical man under whom he was placed for the treatment of asthma advised his mother to try the Handcock treatment for adenoids before resorting to operation. Was treated from June 18th to July 27th, having as a rule three treatments each week, which were afterwards carried on by his mother at home. In November the mother wrote as follows: "I feel sure it will interest you to know that I took M—— the other day to see the doctor who had examined him before, and found adenoids and advised operation. He was delighted with his improved appearance, and said the adenoids had totally disappeared, and that he was better and stronger in every way."

CASE 3.—Male aged 42. Passed on to me by oculist. Complained chiefly of headaches, which lasted from 8 to 12 hours daily. The condition had existed 15 years and was not relieved by spectacles. On examination patient found to have nasal obstruction due to a deflected septum and thickened mucous membrane. He also had a calcareous ridge round the occipital region and calcareous nodules in tissues of back of neck. These were broken up by manipulation and patient made to sneeze daily. At the end of a fortnight he had two days' complete freedom from headaches. The treatment was continued for another three weeks, during which time he rarely had a headache which lasted more than an hour. I then gave patient instructions how to carry on the treatment and have not heard from him since.

Reviews and Notices of Books.

Diseases of the Nervous System: A Text-book of Neurology and Psychiatry. By SMITH ELY JELLIFFE, M.D., Ph.D., Adjunct Professor of Diseases of the Mind and Nervous System, New York Post-graduate Medical School and Hospital; and WILLIAM A. WHITE, M.D., Professor of Nervous and Mental Diseases, Georgetown University, &c. Second edition, revised, rewritten and enlarged, with 424 engravings and 11 plates. Philadelphia and New York: Lea and Febiger. 1918. Pp. 938. Price $7.00.

APART from the larger and more ambitious systems and encyclopædias of neurology, this is one of the first text-books of one volume, we believe, to embrace the whole of neurology from diseases of the sympathetic system to insanity. The authors are surely justified in their contention that all mental disease is nervous disease and that the distinction between the two is artificial. Further, they have in downright fashion refused to admit the claims of certain internists to filch from neurology the diseases of the ductless glands, maintaining rather that the "endocrinopathies" are but a part of vegetative or visceral neurology, as indeed they are. The scheme of this stimulating volume accordingly follows a division of the nervous system into three levels of functional activity, the vegetative, the sensorimotor, and the psychic.

The first is a study in itself, of ever-widening importance; within its limits is found an immense variety of disturbances of visceral mechanisms as yet far from being adequately differentiated into recognisable syndromes. Impairment of function of glandular, gastro-intestinal, genito-urinary, vascular, respiratory, cutaneous, bony, and other systems on their nervous side has been sadly neglected as a subject of clinical study, but a glance at the hundred pages allotted to this in the text-book will serve to demonstrate the richness of the symptomatology that is growing up round these topics and at the same time reveal the serious gaps in our present knowledge. We notice that the authors place the muscular dystrophies or myopathies under the endocrinopathies, in our view, somewhat prematurely; even where there is more justification, as, for instance, in the case of myasthenia gravis and possibly myotonia congenita, the origin of the disease in a defect of endocrine glands cannot be said to be clearly established.

Sensorimotor neurology, the ordinary organic neurology of the schools, is, of course, much better systematised and more thoroughly investigated. The authors have succeeded in compressing a remarkable amount of information into the 450 pages of this section, and, on the whole, the material is well apportioned. The relative meagreness of certain paragraphs may, no doubt, be set down to the desirability of conciseness. More attention, we think rightly, has been given to the exposition of group syndromes than to particularities of individual diseases, a method which avoids much overlapping.

As for the third section, the "psychical or symbolic systems," comprising some 200 pages, it is also remarkably complete within its limits. The authors are frankly Freudian in their outlook, attributing neurasthenia, e.g., "in most instances," to "excessive masturbation or frequent pollutions"—a point of view which has little to commend it, and appears to us unworthy of the critical spirit the authors elsewhere evince. This slavish following of a "master" does not appeal to English neurology.

The volume is nothing if not up to date. All the newest work in neurology and psychiatry is at least touched on, and the student will find paragraphs on dystonia musculorum deformans, dyssynergia cerebellaris progressiva, apraxia, cyclothymia, Alzheimer's disease, and so on, which are not to be found in many other text-books. The illustrations are many and valuable, especially the diagrams. In this connexion the authors appear to have borrowed far more illustrations than are original; in fact, they seem to have been able to obtain from other sources the pick of neurological drawings. The charts that are the conspicuous feature of Dejerine's "Semiology" are all here also. The printing is clear and the index is good. As a compendium of our knowledge in neurology and psychiatry the book is unusually satisfactory and reflects credit on the industry and wide reading and research of its compilers.

Locomotor Ataxia: An Introduction to the Study and Treatment of Nervous Diseases. By WILLIAM J. M. A. MALONEY, M.D. Edin., Neurologist to the Central and Neurological Hospital, New York, &c. Illustrated. London and New York: D. Appleton and Co. 1918. Pp. 299. Price 15*s.* net.

THE avowed plan of this book is somewhat out of the common. Tabes dorsalis is taken as the "text," so to speak, from which to give an exposition of a great deal of clinical anatomy and physiology which may be subsequently applied to other diseases of the nervous system. Thus there are long chapters on disturbances of reflex motor function, sensory function, attitude and movement, of the vegetative nervous system—all as exemplified by tabes, and no doubt of value to the student. The book in its first part really constitutes a kind of introduction to the study of the nervous system, and as such is worthy of note.

The second part is devoted to an elaborate description of the treatment of tabes and of its symptoms, mainly ataxia, by the author's methods, which are modified from, and it may be an improvement on, those of Frenkel, of Heiden. In a word, the keynote of the method is the removal of competing visual images by blindfolding the ataxic patient, thereby ensuring his dependence on such postural images as he retains and facilitating their re-establishment. Apparently the author has had encouraging results.

Where there is so much attention given to the minutiæ of one disease we should have liked to see an attempt to explain the mechanism of the Argyll Robertson pupil. No reference is made to the experimental work of Karplus and Economo in this connexion. Among the visceral crises nasal and uterine varieties are not given a place. Gowers's work

on the auditory atrophy of tabes is omitted. The expectation of life of the tabetic is given as "at least two-thirds that of the average healthy man." Marie and Mocquot have shown that it is even higher than that. There are a fair bibliography and a number of good illustrations.

Diseases of Occupation and Vocational Hygiene. Edited by GEORGE M. KOBER, M.D., LL.D., and WILLIAM C. HANSON. London: Wm. Heinemann (Medical Books), Limited. 1918. Price 32*s.* net.

THE present war has brought home to nations as never before their dependence upon industry to supply them with material for offence and defence, and just now, when in this country the profession is looking forward to a Ministry of Health, attention is being specially directed to the effect of industrial occupation upon health and upon the production of disease. A new branch of preventive medicine is rapidly coming into being, a branch concerned with the environment of the workshop in contrast to the public health of the past concerned with the environment of the home. Development on these lines is needed to meet the altered conditions of the working classes; it is needed, and indeed is overdue, for industrial medicine has not kept pace with the advance in industry which took place in the last century. Those who recognise the need are looking for some standard source of information containing knowledge on the subject as it stands to-day, and the publication from America of the volume under review is opportune. Probably there will be few examining its contents who will not be astounded at the size of this new field of medical science, astounded at the advances made, astounded that they have practised among an industrial population in entire ignorance of it all. The day is past when a doctor can be content to treat his patients, the majority of whom are industrially employed, with no knowledge of how they spend their lives or of the influences injurious to health to which they are daily exposed. Industry and industrial processes are ever altering and expanding without consideration for the health of the workers. The living organism reacts to these influences in new and unexpected ways, which may even be associated with injury to limb and danger to life. "At hercule homini plurima ex homine sunt mala." The practitioner of the future must acquaint himself with what goes on within the factories in his district as well as within the homes.

This volume is undoubtedly of great value and will remain as a book of reference; but the editors set themselves a hard task by seeking contributions from among authorities living in different countries. Each author appears to be a law unto himself unchecked by the editors; considerable overlapping has occurred; divergence of opinion may be detected, and omissions are noticeable. Such matters, however, may be rectified in a subsequent edition and may only be taken as indications of the rapid increase of knowledge on the subjects discussed. Although English writers contribute we note that no reference is made to the following: Professor A. E. Boycott's work on ankylostomiasis among Cornish miners; the report of the Home Office Committee on the use of lead compounds in the painting of buildings; the report of the Royal Commission on Metalliferous Mines and Quarries (with its important conclusions on fibroid phthisis, which have justified the Act just passed giving compensation for silicosis of the lungs); the report of the Home Office Pottery Committee (the basis of the splendid code of regulations now controlling that industry); the work of H. C. Ross on pitch cancer; the report of the Compensation Committee on Dupuytren's contraction; Prosser White's book on Occupational Dermatitis.

Probably, although this book was only published this year, it was too late to contain more than a passing reference to the recent work put out by the Health of Munition Workers Committee. This is especially unfortunate, as the section devoted to industrial fatigue is somewhat inadequate to the importance of the subject. The food question also and the industrial canteen have received more attention in this country recently (particularly from Major Greenwood and Leonard Hill) than is indicated. The same reason may account for the omission of the whole question of toxic jaundice and aplastic anæmia due to tetrachlorethane and the nitro-derivatives of benzine—e.g., T.N.T., which has been so carefully worked out in England.

A general criticism may be made that the space devoted to descriptions of processes and industries is too great for those ignorant of the trades to whom descriptions without personal inspection are of little value and too small to be useful to those already acquainted with them. This fault is, however, one common to most treatises on occupational hygiene. The editors have aimed high, and if their aspirations have not been entirely fulfilled, nevertheless they are to be congratulated in getting together much useful knowledge on a subject of rapidly increasing interest and importance, and they should be rewarded by an early call for a second edition. Should this happily occur, the suggestion is worth making that the volume should be divided into two separate works—one dealing with the hygiene of industry and the means which it affords for healthy life to the community, and a second dealing with occupational disease and the way in which industry falls short of its high calling.

Hysterical Disorders of Warfare. By LEWIS R. YEALLAND, M.D., Resident Medical Officer, National Hospital, Queen-square, London. With Preface by E. FARQUHAR BUZZARD, M.D., F.R.C.P., Lieutenant-Colonel, R.A.M.C. London: Macmillan and Co. 1918. Pp. 252. Price 7*s.* 6*d.* net.

Dr. Yealland's readable volume on the hysterical disorders of warfare appears at a time when it is likely to prove of immediate and practical usefulness to the medical profession. Considerable numbers of cases of hysteria are being dealt with in special and in general military hospitals, large and small, and by boards, pension committees, and individual medical men. Such cases cannot be satisfactorily handled for therapeutic purposes except by active, intelligent, immediate, persuasive tactics on the part of the individual who will devote himself to each particular case. Treatment cannot be allowed to devolve on deputies if successful results are to accrue; the problem is that of one mind *versus* another, and its solution demands unremitting application on the part of the therapeutist. The reward is worth the mental labour, however, for in this field, above all others, nothing succeeds like success, and each cure is not merely an incentive for further triumphs, but is a potent factor in the establishment of that easy and reliable self-confidence the possession of which is half the battle.

Various methods of psychotherapy are in vogue at present for the treatment of hysteria. The exponent of hypnotism, or psycho-analysis, or of suggestion without apparatus may obtain results satisfying to himself and pleasing to his own views of the nature of hysteria; others, less concerned with psychological theories, may give the patient a whiff of ether and obtain just as good and as lasting effects. Dr. Yealland is an accomplished exponent of treatment by means of a combination of electricity and mental persuasiveness, which in his hands, judging by his records, has proved literally irresistible. Apparently he has not had one single failure out of hundreds of cases, for which he deserves cordial congratulations. Every variety of hysterical phenomenon has been met and successfully combated; not merely the simple case of flaccid palsy of short duration, already half-cured by auto-suggestion ere the seance begins, but the complex and difficult case of functional spasm of accommodation, which has required many hours of continuous treatment for its exorcism. Dr. Yealland enters into the minutest details of his particular technique, and a perusal of his selected cases will provide adequate information for all who desire to learn and practise this particular method. Incidentally, the author unconsciously reveals the secrets of his unfailing success—ingenuity of application of the method, nimbleness of mind in the presence of unforeseen hitches, imperturbability of temper, patience and persistence which have gone to almost incredible lengths, enthusiasm, above all, an insight into the mind of the sufferer without which no amount of electricity would effect a cure.

If there is no special analytical investigation of the phenomena from a psychological standpoint, the value of the method is not thereby lessened. Dr. Yealland shows how potent is the fact of relief of symptoms in itself re-enforcing and consolidating the therapeutic gain, so that instances of relapse are few and far between. The book is written in an easy, colloquial style, and, apart from the details of the method in a large variety of cases, also contains useful diagnostic criteria between organic and functional nervous disease.

THE LANCET.

LONDON: SATURDAY, AUGUST 24, 1918.

The Drug-supply after Four Years of War.

THIS country has depended upon overseas sources for its supply of most of the important vegetable drugs before the war; and before the war the whole world drew practically all it needed in the way of the so-called "newer remedies" from Germany. But when need drives we can do without Germany. It is true that all drugs are relatively scarce and many of them very costly at the present time, but among the thousand and one materials inside and outside the Pharmacopœia those which are absolutely unprocurable can be counted on the fingers of one hand, while it is perhaps safe to say that not a single essential drug has entirely vanished from the shelves of our chemists' shops—a tribute to the power of our Navy. When the market sections of the drug papers speak of a drug as being scarce it must not necessarily be inferred that the drug is being produced only in small quantities; the accurate inference is that the quantity available for distribution through the druggists to the civil population is greatly reduced, for we must remember that the demand for drugs from the medical services of our own and our Allies' Armies has to be met first. This is a not unimportant point, and we draw attention to it in order to emphasise the fact that when a drug is reported to be scarce it does not mean that sick and wounded soldiers lack the proper remedial agents. Then, again, it is common knowledge that glycerin is difficult to obtain and that castor oil of the best quality cannot be bought in the open market. But there is no intrinsic scarcity of either of these substances; they are being produced in quantities far exceeding the pre-war output, but the whole of the production is required for purposes other than those medicinal. Thus, taking a broad view, we have much to be thankful for. Notwithstanding the U boats, trading vessels are bringing to port those vegetable drugs that cannot be produced in our soil and climate, and though freights are amazingly high, cargoes much reduced in weight, and ships less frequent and longer in passage, the storehouse is never empty. If there is no Turkish opium to be had there is a sufficiency of Persian; if we do not import quinine from Germany we can secure a goodly proportion of the product of the Dutch factories, or we can make quinine here from the cinchona bark of Java.

The keeping up of a regular supply of synthetic products presents a wholly different problem. Germany had, as everybody knows, secured a practical monopoly of the dye industry, and the synthetic production of drugs was an offshoot of that industry. When war broke out nobody foresaw how long it would last, and nobody appears to have begun at once to make preparations to produce synthetic drugs on a scale adequate to supply the country's needs in the event of a long war. The American chemists were not hampered like our own manufacturers were, and they got to work before us. But the necessity of establishing a fine chemical industry in this country was recognised in due course, and, after the initial problems had been solved, our chemists were able to produce some of the more commonly prescribed compounds in commercial quantities. In France, Spain, Holland, Japan, and especially in Switzerland, and even in some of our own overseas dominions, the drug industry has now been established. The result is that the world has been able to make itself independent of Germany; and if it can do this in war-time we may be sure that it will be able to do it when labour becomes plentiful and the scarcity of raw materials is no longer a factor to be reckoned with. In his altogether admirable address at the Fifty-Fifth Annual Meeting of the British Pharmaceutical Conference, Mr. C. A. HILL, the President, mentioned salicylic acid, aspirin, phenacetin, hexamine, and saccharin as substances which are being produced here on a regular scale. He did not extend the list further, but he did something more reassuring; for he said flatly, that "whenever a particular substance has been required for a particular purpose, British chemical science *plus* British chemical industry have not failed to produce it in requisite amount and of requisite purity within a reasonable time." Now all this is true enough, but it is important, in view of the future, to add Mr. HILL'S proviso that, "questions of cost apart, the thing can be done." Lord BALFOUR'S Committee on Trade After the War recommended that during a specified period British manufacturing chemists should be given very generous protection, so as to encourage them to establish here the synthetic drug industry on a large and permanent basis. We hope that the "questions of cost" will not be too far "apart." This class of drug can and should be produced here at a price which will allow of the products being sold for sums approximating to those which they would fetch if imported from abroad.

We have sufficient confidence in the chemical skill and commercial acumen of our manufacturers to believe that the public would not suffer unduly as a result of the protection recommended. The President of the British Pharmaceutical Conference in his address did not make the mistake of leading us to think that we had made any remarkable progress in the synthetic drug industry. We have made a good beginning, it is true, but the manufacture of some of the drugs mentioned has been, as he told the Conference, an industry *ad hoc*. Obviously this will not meet after-war conditions, for the production of synthetic drugs on an economical scale must necessarily be part and parcel of a large and general scheme. It is in the imaginative lay mind that the danger lies, and it is to be hoped that the Exhibition of British Scientific Products now being held at King's College

will not have the effect of impressing the public with the belief that so far as the production of drugs is concerned our difficulties are over. Those behind the scenes will tell us that we are only at the beginning. Nevertheless, as an account of this exhibition in another column shows, a good beginning has been made, and there is no reason why progress should not go on provided that the movement receives the whole-hearted support of the public and the assistance of the Government when the strife is at an end. It is clearly demonstrated that British manufacturers are thoroughly capable of supplying us with products of a quality as good as, if not better than, those hitherto supplied from foreign sources. Their patriotic enterprise deserves all the encouragement it is possible to give Medical practitioners need not be reminded how intimate is the relationship of the manufacture of dye for stuffs to the production of these drugs; and it is to the great dye factories, rather than to the druggists, that we must look for the development of the industry. Before the war we visited some of the most important of the German dyestuffs factories; the visit impressed upon us the fact that a successful synthetic drug industry depends upon a successful dyestuffs industry.

Industry and Medical Service.

FUTURE students of the social revolution of the nineteenth century, the result of sudden and unprecedented industrial development, will wonder at the blindness of the medical profession to the altering conditions around them; they will wonder that, even in the twentieth century, medical men continued to work on the plan handed down to them by their seventeenth- or eighteenth-century forbears, who practised among a clientèle busied with agriculture or home industries, and who were closely acquainted with the daily life of their patients, and thus able to dispense general advice as well as drugs and professional counsel. One definite opening occurred to keep the profession in touch with industrial patients, an opening of which but little advantage has been taken—doctors, when the Factory Act of 1833 fixed a limit of age to juvenile employment, at a time when birth certificates were unknown, were called upon to certify the age of children presenting themselves for employment, and were allowed to charge the child a fee of 6*d*. With the introduction of birth certificates the *raison d'être* of the work was changed, and the certifying surgeons were asked, in addition to inspecting the birth certificate, to certify the fitness of the child or young person for the proposed employment. The fee has remained the same, although in 1878 the employer was called upon to pay half of it, and since 1891 the whole. Controversy has centred round the place of examination, whether it should be at the surgeon's rooms or at the factory; but the controversy has been suspiciously associated with the fact that a visit to the factory is remunerated at 2*s*. 6*d*. for certifying five or less youngsters. Here the position stands to-day, and since the ridiculously low fee of 6*d*. produces the value of 6*d*., it has been aptly said that the certifying surgeon is paid either too much or too little. Too much for what he does, or too little for what he ought to do—certainly too little if the instructions now issued by the Home Office relating to the examinations are observed.

The truth is the medical profession has not seized the chance to make its weight felt when visiting industrial establishments, by examining the processes carried on and the places where they are carried on, and by advising on factory hygiene. Exceptions there have been, especially in recent years; and factory managers are here and there learning to appreciate the value of a doctor in connexion with employment. The services he can render are becoming obvious in these days of compensation for accident and disease, and of scientific management and standards of efficiency which call more and more for the alertness of health. And, as we have said elsewhere this week, in reviewing a valuable treatise upon occupational hygiene and pathology, the present war has brought home to all nations their utter dependence upon industry, while it is essential that this country, the mother of inventions and modern trade, should not fall behind in any organised plans for benefiting the medical conditions of the workers. Our feeling is that the certifying surgeon should examine not merely juveniles, but adults on engagement, organise first-aid treatment, point out unhygienic conditions of work—poor lighting and bad ventilation—advise on unhealthy posture and excessive weight-lifting and on hours of work in relation to rest, pauses, and meal-times. More should be given to the certifying surgeon to do, and the emoluments should rise accordingly.

At the present moment we should prefer to see development on these lines rather than some soothing of the ruffled feelings of certifying surgeons by granting them an increase of fees, up to possibly 1*s*. a head of those examined, a suggestion which, we understand, is being put forward. That the present fees are inadequate is obvious, but it is the work of the certifying surgeon which is to-day wrong, and is especially in need of being recast now that the whole system of medical practice is awaiting reorganisation. Good work never exists long without recognition, and we hope, even if the present grievances remain unremedied until the Ministry of Health is established, that ere long the medical profession will be brought closely in touch with industry, and that every factory will have its medical adviser, not merely certifying youngsters on engagement, but following them up by periodical examination and studying the effect of particular employment upon their physique and health—carrying on, indeed, the work of the school medical officer, with whose records the certifying surgeon should be acquainted. Here is a new field of medical activity the importance of which is already being tested and proved by the Ministry of Munitions with its whole-time medical services in certain factories; and it is a field which must be cultivated if health, which is the basic wealth of a nation, is to be raised to a level where industrial efficiency is given its best opportunities.

Annotations.

"Ne quid nimis."

THE CASE-MORTALITY OF INFECTIOUS DISEASES.

THE annual report of the Metropolitan Asylums Board for 1917 appears in the abbreviated form to which the exigencies of war have accustomed us. But the absence of charts and tables does not do much to diminish the interest excited by the changing values of the case-mortality for the various common infectious ailments. In the case of scarlet fever and diphtheria the death-rate has not altered materially. Together these two infections account for more than three-quarters of the total admissions to the hospitals of the Board, and the death-rate is therefore built on large numbers. The figures for 1917 were 1·9 and 6·7 respectively, being only a single point different from the 1916 figures, plus in the case of scarlet fever, minus in the case of diphtheria. It is apt to be forgotten that while in the last decade of the nineteenth century the case-mortality of diphtheria rapidly fell, as a result of antitoxic treatment, from over 30 to its present figure, the case-mortality of scarlet fever has fallen in about the same proportion, but more gradually, from year to year since the earlier "seventies," when it was above 12, to its present value below 2. In the case of the four other acute infectious fevers with which the Board has dealt during the year the death-rate shows in each case a rise of roughly one-quarter on the 1916 figure. Fortunately in the case of enteric and cerebro-spinal fevers the total number of admissions is but small—enteric, 172; cerebro-spinal, 101—but none the less the death-rate of 17·3 in the former and 53·7 in the latter is worthy of serious thought. Progress in regard to both has been on the side of prevention rather than of treatment. The total deaths are such as to warrant more continuous effort than has yet been given to improvement in the clinical treatment of these diseases. The numerical aspect is quite otherwise in the two remaining infectious fevers of uncertain etiology. 2951 cases of measles were admitted during 1917 to the hospitals of the Board, and of these 11·7 per cent. died; 391 cases of whooping-cough, and of these 13·4 per cent. died. The death-rate in the case of whooping-cough is the highest on record, in the case of measles higher than any figure since 1911. In neither instance, of course, does the death-rate of patients in the Board's hospitals give any clue to the average case-mortality outside, because it is only the cases with serious complications, for the most part broncho-pneumonia, which are admitted. But making all allowance for this circumstance, the figures in the 1917 report reveal measles and whooping-cough once again as the dangerous plagues which they are to the town child under present social and hygienic conditions, and justify any possible speeding-up of the scheme for home nursing which the Local Government Board has set in action and subsidised by grants-in-aid.

DRIED VERSUS CONDENSED MILK.

THE official résumé (THE LANCET, July 13th, p. 55) of Dr. F. J. H. Coutts's report to the Local Government Board on the rôle of dried milk in infant feeding has brought us an eloquent plea from across the channel for the claims of sweetened condensed milk for hand-fed babies, and at the same time for an international solution of such a many-sided problem as the artificial feeding of infants. Our correspondent, Dr. P. Lassablière, is chef de laboratoire to the Faculty of Medicine in Paris, and speaks on the basis of an experience of several years with more than a thousand hand-fed babies, of whom some hundreds were brought up exclusively on condensed milk. The passage in the Local Government Board's résumé on which he bases his remarks is as follows:—

> Sweetened condensed milk is often used for baby feeding. Dried milk has the advantage, when made up with the proper proportion of water, of containing the essential food elements in a proportion more suitable for the baby than when full-cream sweetened condensed milk is used. The latter, if made up so as to give the right proportion of fat, has a very excessive amount of sugar. This is not good for the baby, who usually becomes fat and flabby, and is liable to suffer from diseases such as rickets, &c.

Dr. Lassablière states that all the babies under his care brought up on condensed milk showed a normal growth and no signs of scurvy or rickets after 14–18 months or more of its use. More than this, in a number of babies whose growth had been retarded by digestive troubles, a change to condensed milk was accompanied by a return of digestive power and of normal development. He has seen no harm follow the excess of saccharose in the milk mixture, and agrees with Dr. J. I. Fanz, of Jefferson Medical College, in believing[1] that even in young babies saccharose is hydrolysed by the enzyme "invertine" to an extent not generally admitted. Dr. Lassablière finds in the laxative action of the saccharose a definite point of value for the hand-fed infant, which would justify the excretion of a certain quantity unchanged, if this is in fact what takes place. He quotes with approval Professor Lo Monaco's recent observations on the influence of saccharose on the digestive glands. Finally, he explains the divergent experience of medical men in regard to the effect of condensed milk on babies by the different dilutions adopted, and to some extent by the differing quality of the brands of milk on the market. Unsweetened condensed milk he considers positively dangerous. Dr. Lassablière concludes his letter with an excursus on fashions in medical theories and opinions, and asks to have condensed milk judged by the test of controlled clinical observation. In this country at the moment the shortage of sugar might stand in the way of such a test.

NASAL BREATHING IN THE TOWN CHILD.

To snivel or to snuffle is such a familiar habit of the small child in poorer town areas that it excites no interest and barely any annoyance in the family circle, the mother or elder sister being content to wipe away with any old rag the mucus or muco-pus actually visible outside the nose. But it is the secretion within the nasal cavities which alone is of importance, and its accumulation effectually prevents the free nasal breathing which is as important to healthy development as free nutrition and excretion. Some relation between adenoid vegetations in the naso-pharynx and chronic nasal catarrh is generally recognised, although doubt may arise as to which is cause and which is effect. In a clinical note which we publish this week Dr. Isabel Ormiston deals with a method of treating adenoids by means of a nasal drill designed to keep the

[1] New York Medical Journal, 1915, i., 253.

breathing passages free from obstruction by secretion. Older children are taught regularly to blow their noses without constricting the orifice in a way which expands the chest at the same time. In children too young to do this the same result is obtained by the application of an iris-root snuff to produce sneezing. Dr. Ormiston admits that she was sceptical of the method when it was brought to her notice by its inventor, but after trying it herself for four years and in an experimental clinic for six months with Dr. Octavia Lewin, she has become convinced of its value. In children with adenoids she finds the first improvement in the digestive system, followed by relief of deafness and by a steady shrinkage in the adenoid growths. Both the cases which Dr. Ormiston cites were found to be better in the summer, the usual history with such children, and it may be contended that the method is only likely to be successful in cases where ordinary systematic breathing exercises would also have succeeded. But there is no doubt that the drill is an effective way of performing the very necessary nasal toilet, and results on a larger scale will be looked for with interest.

SPIROCHÆTAL BRONCHITIS.

MORE than ten years ago Castellani discovered in Ceylon a form of bronchitis due to a microbe which he termed *Spirochæta bronchialis*. Since that time cases have been described in various parts of the world. At a recent meeting of the Académie de Médecine of Paris Dr. H. Violle reported what appear to be the first cases of this curious affection observed in France. During three months he has seen 30 cases in the naval hospital of Saint-Mandrier, Toulon. The sputum is bloody, viscid, and of a uniform rose tint resembling gooseberry juice. The colour is not observed in any other affection, and hence is diagnostic. Dr. Violle therefore proposes the title "bloody bronchitis." Some of the patients were admitted with the diagnosis of phthisis, but repeated examinations of the sputum failed to reveal the tubercle bacillus. On the contrary, smears stained with nitrate of silver showed spirochætes, sometimes innumerable, of all forms and dimensions, some long and fine, others thick and squat, with various undulations. Often these organisms were almost in a state of purity, sometimes they were associated with other microbes. Blood examination revealed slight anæmia, probably due to the repeated hæmoptysis. The affection is relatively benign; the onset is insidious, the general condition is good, there is no fever, but headache occurs. The pulmonary signs are slight and sometimes are absent. Often they are those of ordinary bronchitis, sometimes of apical bronchitis, or of congestion of the bases. Cough is frequent and may be painful. The sputum sometimes is abundant and may regularly be hæmorrhagic or muco-hæmorrhagic alternating with muco-purulent. Relapses are frequent. It is important to recognise the affection, as it is very contagious. It appears to have been introduced into France by Asiatic troops or workers, or by troops which had been in the Levant. The disease has become acclimatised in France—in the south, at any rate. A quarter of the patients were Frenchmen. The affection may be complicated by graver affections, such as tuberculosis, pneumonia, or broncho-pneumonia, the germs of which evidently enter the lung through the breaches made by the spirochætes. A look-out should be kept for the carriers.

THE REAL BOTULISM.

THE most recent monograph (No. 8, July 31st, 1918) of the Rockefeller Institute for Medical Research is devoted to a clinical and experimental study of botulism by Dr. Ernest C. Dickson, from the Stanford University Medical School at San Francisco. Dr. Dickson's interest in the subject dates from an outbreak which occurred in December, 1913, after a banquet in a students' club house, when the only article of food taken by all the 12 students attacked was a salad of string beans (presumably the equivalent expression for our runner beans) prepared at the home of one of the members of the club. The *B. botulinus* was not recovered from the organs of the one student who died, and all the salad had been eaten, leaving none to examine; but the clinical picture was typical of botulism, and the peculiar type of thrombosis in the blood-vessels of meninges and brain, since shown experimentally to be characteristics of botulism, was first demonstrated in the fatal case by Professor W. Ophüls, pathologist of Stanford University. Since this time Dr. Dickson has investigated a number of outbreaks on the Pacific coast of America, and has succeeded in isolating three strains of the infecting organism, twice from the crops or gizzards of chickens which had died after eating string beans or discarded maize, and the third time from a can of string beans, fellow to one which caused poisoning among a party of 15 at an hotel dinner at Escondido, California, in January, 1917. In this as in other outbreaks the most striking symptom was progressive muscular weakness, especially marked in the muscles of the head and neck and called by the expressive name "limber-neck" when it occurs in domestic fowls. In one outbreak the condition is described thus:—

> "There was extreme flaccidity of the muscles of the neck, allowing the chin to rest upon the chest or the head to fall backward if not supported when the patient was elevated. It was a common occurrence to see a patient move her head with her hands, and one girl who had long braids used them, with the head of the iron bed as a pulley, to swing her head into position when she wished to move. The head could be rotated and held from falling to either side, but the anterior and posterior supports were lacking."

The monograph will be read with keen interest by all those who found a close resemblance to the symptoms of botulism in the epidemic encephalitis of a few months ago. Dr. Dickson's monograph is of special value because it shows that botulism, while endemic in the United States and comparatively common on the Pacific coast, is not essentially a meat poison, but may also occur in canned vegetables and fruits. He advocates a campaign of education to inform those who can fruits and vegetables of the danger of infection with *B. botulinus*.

Colonel William R. Smith, M.D. Aberd., D.Sc., F.R.S. Edin., Sheriff of the City of London, professor of forensic medicine in King's College, London, and Principal of the Royal Institute of Public Health, is a candidate for the Parliamentary representation of the Universities of Scotland.

THE identity of Mr. A. Stanford Morton may not have been generally recognisable under his official description as Dr. Andrew Morton in the list of honours conferred by the King of Italy (THE LANCET, August 17th, p. 215).

BY an Order in Council, dated August 14th, the provisions of the Parliament and Local Elections Act, 1918, have been extended to the election of Members of the General Medical Council by registered practitioners resident in the United Kingdom, the effect of which is to extend the term of office of the existing Direct Representatives until Dec. 31st, 1919.

THE BRITISH SCIENTIFIC PRODUCTS EXHIBITION.

AN inspection of this interesting exhibition showed that there were in all 14 sections distributed amongst the class-rooms, theatres, hall, and corridors of King's College. Many sections related to great industrial processes, as those concerned in the production of textile fabrics, paper, ferrous and non-ferrous metals, glass, refractory materials (firebricks, carborundum). We confine ourselves, however, to brief notices of those products which have an important bearing on the position of medical science. These sections all told the same story; they served to illustrate our dependence for supplies in the past on enemy countries and our independence for these supplies in the future. It is obvious that the exhibits could not complete the tale of our scientific indolence in the past, since many products have been obtained which it would not be in the public interest to exhibit. The sections of direct interest to medical men were three in number: Section I., Chemical Products and Processes; Section IV., Optical Apparatus; and Section VIII., Surgical, Bacteriological, and Pathological Appliances.

SECTION I.—CHEMICAL PRODUCTS AND PROCESSES.

This section was perhaps more eloquent than any other of the resources of British science, particularly in the direction of building up synthetics. The Gas Light and Coke Co., of Beckton, E. 16, for instance, exhibited a most interesting series of chemical substances chiefly the products of coal tar, the parents of so many synthetic drugs, amongst which may be mentioned beta-naphthol, salicylic acid, acetyl salicylic acid (the aspirin of German manufacture), ammonium salts, and cyanogen products. In addition, there were fine specimens of carbolic acid in both glacial and detached form. Messrs. Evans, Son, Lescher and Webb, Ltd., of 56, Hanover-street, Liverpool, showed an attractive series of drugs, all evidencing careful scientific preparation. Amongst these were atropine and hyoscyamine, bismuth tribromophenol (hitherto familiarly known as xeroform), chlorophyl, hexamine, lanoline, salvarsan and sodium sozoiodolate, and thymol, formerly imported from Germany, but now obtained from raw material grown in India. Messrs. Evans, Gadd, and Co., of 100, Fore-street, Exeter, exhibited fine examples of lysol. The exhibit of the British Drug Houses, Ltd., of 22–30, Graham-street, City-road, N. 1, comprised some 80 samples of chemical preparations representative of the extension in the domain of fine chemical manufacture which this company has made during the war to meet the demand for products hitherto obtained from Germany. These included bismuth, tribromophenate of bismuth (German xeroform), thymol iodide (German aristol), iodatol (German iodopin). Similarly were shown microscopic reagents and dyes and standard analytical reagents, all formerly supplied from Germany. Altogether this exhibit was a quite impressive one, having regard to the object of demonstrating that what the Germans could do the British could do. Messrs. Boots Pure Drug Co., Ltd., of Nottingham, presented an interesting series of fine pharmaceutical products; amongst these were acriflavine, acetanilide, aspirin, atropine and its salts, butyl chloral hydrate, cantharadin, chloramine, and di-chloramine T, digitalin, halozone, hexamine, homatropine and its salts, hyoscyamine, phenetidin, proflavine, saccharin, salicylic acid, soluble aspirin, theobromine salicylate, and tropine. Amongst the exhibits of The Bradford Wool Extracting Co., Ltd., of Pit Lane Mills, were some fine chemicals, including phenacetin, salicylic acid and its derivatives, and acetanilide. As examples of chemicals illustrating the manufacture from raw potash material produced in this country, the British Cyanides Co., Ltd., of Oldbury, Birmingham, exhibited specimens of carbonate and bi-carbonate of potash, the permanganate, ferrocyanide, and chloride. The products of the "Wellcome" Chemical Works (Messrs. Burroughs, Wellcome and Co., Snow Hill Building, London, E.C.) formed an interesting exhibit of synthetics, notably kharsivan and neokharsivan, replacing the German salvarsan and neo-salvarsan. Similar replaced products were hexamine (syn., German urotropine), phenacetin, aspirin, among a number of fine chemicals used in medicine. Pilocarpine, atropine, eserine and homatropine and their salts were made on a commercial scale by this firm several years before the war broke out, and the researches carried out in their laboratories have produced "ernutin," a synthetic product presenting the active therapeutic principles of ergot, and emetine hydrochloride and emetine bismuth iodide. The Chemical Research Laboratory of the University of St. Andrews contributed some instructive specimens illustrating the manufacture of synthetic drugs in this country. No less than 25 fine chemicals, including novocain and orthoform, were shown and now prepared on the manufacturing scale by processes developed in the above laboratory since the outbreak of the war. Luminescence chemicals were the attractive feature of the exhibit of the Cold Chemical Co., of 13, Canal-road, Kingsland-road, N. 1. Amongst these were calcium tungstate, the basis of X ray intensifying screens, and cadmium tungstate and synthetic willemite fluorescent materials for the same screens. Sir William Crookes exhibited specimens of anti-glare glass, which, used in spectacle lenses for our troops and airmen, is doing good service, and also in munition work in which the workers are exposed to powerful light and heat rays. By the addition of various metallic oxides the glass acquires the dual property of arresting both the ultra-violet and the heat radiations. Messrs. Hedley and Co., of 120, Harrow-road, Leytonstone, showed specimens of ethyl chloride, bromide, and other related ethers used in anæsthetic practice. Ethyl chloride was manufactured in Germany to the extent of hundreds of tons both for the manufacture of pharmaceutical products and "intermediates" in dye production. An interesting series of organic compounds, the manufacture of which has been undertaken since 1914, was exhibited by Messrs. Thomas Kerfoot and Co., of Bardsley Vale Mills, Bardsley, Lancs. These included "kerocain" (Kerfoot's novocain), phenacetin, acetyl salicylic acid, and a number of chemical materials essential in the manufacture. Messrs. Boake, Roberts, of Carpenter's-road, Stratford, London, had a very interesting collection of organic salts, including acetates, formates, butyrates, and salicylates, and there were also shown specimens of formaldehyde, paraldehyde, and hexamine. Such is a rapid review of the more important preparations of medical interest in this section, all illustrating our independence of enemy supplies in the future, and the remarkable results which have followed our awakening to the need of applying science to the production of many essentials in medical practice.

SECTION IV.—OPTICAL APPARATUS.

The exhibits in this section are the outcome of this country finding itself at the outbreak of the war cut off from a supply of optical glass required in the construction of gun-sighting telescopes, field-glasses, and other service instruments. The essential constituent of certain glasses is potash, of which Germany possesses favourable sources. Now ample supplies of potash of high quality are produced by electrolysis in this country, with the result, as Professor R. A. Gregory says, that "glass-makers will never need to go to Germany again for this substance." We refer to the important results shown in this section because they clearly have a bearing upon the efficiency of medical investigation in which good lenses are a *sine qua non*, as in laryngoscopy, microscopic work, and bacteriology.

SECTION VIII.—SURGICAL, BACTERIOLOGICAL, AND PATHOLOGICAL APPLIANCES.

The importance of a supply of high-quality glass in medical practice was further illustrated in the exhibit of artificial eyes by Mr. Albert E. Waters, of the Empire Works, Mole-street, Sparkbrook, Birmingham. Prior to the war, it is stated, the major portion of the artificial eyes used in this country were imported from Germany. These eyes are now superseded by a British-made artificial eye superior to the German article in every particular. Messrs. Allen and Hanburys, Ltd., of 48, Wigmore-street, London, W., exhibited an improved cystoscope, giving large-field upright image and sharp definition. Constructed on the same principles is a cystoscope for the combined irrigation of the bladder and catheterisation of the ureters. It is fitted with channels through which ureteral catheters can be passed, and there is also an improved rubber valve which can easily be rendered sterile and

replaced when necessary. The British Laboratory Ware Association, Ltd., of 24, Martin's-lane, Cannon-street, London, E.C., exhibited well-known forms of apparatus used in bacteriological practice; all testify to the excellence of British manufacture. Amongst the exhibits of Messrs. Chas. W. Cook, Ltd., of University Works, Bridge-street (Owens College), Manchester, were a hand-press and filter designed by Professor Delepine for aseptically extracting pulp of juices from fresh tissues, and a microtome by the same designer for cutting large sections of animal tissue and for paraffin wax and other sections when using the freezing method. The manufacture of fluorescent and intensifying screens used in X ray work was practically a German monopoly, but Messrs. Harry W. Cox illustrated in their interesting exhibit how the enemy has been beaten in this direction. Messrs. Hawksley and Sons, of 357, Oxford-street, London, W. 1, exhibited their hæmacytometer, the feature of which is the special form of counting chamber. An all-glass hypodermic syringe, an ampoule syringe, a blood "extractor," and double-channel glass catheters, formed the novelties on the stall of Hyposol Limited, of High-road, Wealdstone, Harrow, while Messrs. S. Maw, Son, and Sons, Ltd., of 7-12, Aldersgate-street, London, E.C. 1, showed hypodermic syringes, together with antiseptic dressings and the "limpet" nail-brush for one-armed men. A very representative and up-to-date collection of surgical instruments was shown by Messrs. Mayer and Meltzer, of 71, Great Portland-street, London, W.1, most of them referring to war surgery and made since the war began. The exhibit included Shipway's warm anæsthetic vapour apparatus, already described in our columns. Mr. W. J. D. Roberts, of 81, Mortimer-street, London, W. 1, showed an improved stretcher, the chief claim of which is that the canvas is easily removed for the purpose of cleaning and sterilising, thus reducing the risk of infection to the patient. The exhibit of the Surgical Requisites Association, of 17, Mulberry-walk, Chelsea, referred chiefly to splints, as, for example, the papier-mâché splint, made on an actual cast of the affected part, so securing an accurate anatomical fit. The material is light, non-inflammable and waterproof, and, what is of some importance, transparent to X rays. A thoroughly representative exhibition of typical serums, vaccines and tuberculins was given at the stall of Messrs. Burroughs, Wellcome, and Co., all these being products of their research laboratories at Herne Hill, London.

We have attempted to deal with only those sections of the exhibition which give ample illustration of what British scientific effort is doing to ensure for medical science the efficiency of its material and equipment and to secure them entirely and satisfactorily within our own country or dominions. It need hardly be added that the other sections included industrial developments of the greatest importance to the nation's position in the world, developments which will advance more and more as science is brought to bear on the methods of production.

REPORT OF THE SANITARY COMMISSIONER WITH THE GOVERNMENT OF INDIA FOR 1916.

THIS annual report on the health of the population of India is as comprehensive and clearly arranged as in former years. It deals with the health conditions of 315 millions of people (about three-fourths of the population of the British Empire), including those of the European and Indian armies, the prisoners in jail, and the civil population generally, and gives an account of the various medical institutions, hospitals, dispensaries, medical schools and colleges, and laboratories for research work throughout the country.

Health of the European Army in India.

It is pointed out by the Director of Medical Services in India at the commencement of the portion of the report dealing with the health of the European troops, that, on account of the war conditions prevailing, any "comparison with statistics previous to 1914 must take into account the following factors: a continual outflow of healthy individuals to overseas forces, while soldiers unfit for active service are retained in India; this automatically raises the proportion of unfit men to the total strength; the lower standard of physique required for garrison battalions; a continued ingress into India from overseas forces of debilitated men who are more susceptible to disease; and the advent of large numbers of unacclimatised men straight from Europe with a susceptibility to tropical diseases." The average strength of troops (Regulars and Territorials) during 1916 was 60,737 warrant and non-commissioned officers and men. The admissions to hospital from all causes were in a ratio of 772 per 1000, the number constantly sick averaged 39·75, the deaths 6·54, and the invalids sent home 22·11 per 1000. Compared with 1915, when the admissions had been 823·1, the constantly-sick 39·08, the deaths 5·95, and the invalids 19·80 per 1000, all the ratios except that for admission to hospital are higher, and compared with the ratios for the preceding five-year period (1911-15) there is a considerable increase in every case, the quinquennial ratios having been 601·2, 31·06, 4·51, and 8·68 respectively. There is, however, no return to conditions such as prevailed in the period, 1881-1890, when the constantly sick averaged 73 and the deaths 14·79 per 1000. The chief causes of death from disease in 1916 were heat stroke (45 deaths), enteric fever (33), pneumonia (33), cholera (19), malaria (19), and dysentery (18). The healthiest parts of the country appear to have been Southern India and Upper Burma; in the former region (including Bangalore and Madras) the admission and constantly-sick ratios were only 501·9 and 28·7 per 1000 respectively; in Burma Inland (or Upper Burma) these ratios were 598·5 and 29·5 per 1000. The troops on the western coast, mostly at Colaba (Bombay), showed the highest constantly-sick ratio (58·7 per 1000), the admissions being in a ratio of 886·5; while those on the North-West Frontier (Peshawar, Nowshera, &c.) had the highest admission ratio (1116·5), the constantly sick averaging 45·7 per 1000. The chief large stations (with over 1000 effective strength) that showed excessive sickness were Sialkot (1326·3 admissions per 1000, of which 543·5 were due to malaria), Nowshera (1291·0, of which 457·8 malarial), Peshawar (1270·8 and 679·2), Ahmednagar (1070·9 and 380·6), Lahore (1009·9 and 162·6); the constantly sick ratios in these stations were 62·9, 56·1, 47·1, 41·1, and 50·6 respectively. On the other hand, Poona had only 610·1, Secunderabad 544·3, and Bangalore 481·9 admissions per 1000, the constantly-sick ratios being 46·7, 30·8, and 27·7 respectively.

Malaria was in 1916, as always, the predominating cause of inefficiency among British troops in India, and was more prevalent than in any year since 1909: there were 186·0 admissions and 0·31 deaths per 1000, compared with a quinquennial average of 123·1 admissions (1911-15) and 0·23, respectively, for 1911-15. The North-West Frontier group of stations suffered most with an admission ratio of 442·4 per 1000, Peshawar itself, with a garrison of 2363 European troops, having 679·2 per 1000, the most severe prevalence in the past seven years. Owing to frontier disturbance the troops had to be brought down from the hills earlier than usual. There was also an excessive rainfall. The general increase in malaria throughout the country is considered to have been largely due to the endemicity of the disease in certain garrisons of Northern India; the existence of active "carriers" among troops returning from overseas; the presence of a large proportion of young, unacclimatised soldiers, category B men, and garrison battalions; abnormally high rainfall at certain stations; and frequent and unavoidable changes of medical personnel. In addition sandfly fever caused 45·9 and pyrexia of uncertain origin 7·4 admissions per 1000, compared with 41·1 and 9·8 respectively in 1915; 6 deaths were due to the latter disease. Enteric fever caused 5·2 admissions and 0·54 deaths per 1000; in the decennium 1906-15 these ratios had been 7·3 and 1·28 respectively. The admission ratio was higher than in 1915 (3·7); higher, indeed, than in any year since 1909, the year in which effective inoculation was introduced. At certain stations there were actual epidemics, though on a small scale compared with those of former years; thus, at Bangalore there were 59 admissions for fevers belonging to the "enterica group" (16·7 per 1000), 5 only being actual enteric, while 51 were paratyphoid A and 3 paratyphoid B; at Nowshera there were 28 cases (13·9 per 1000) and at Peshawar 30 cases (12·7 per 1000); at Bombay there were 17 cases (10·6 per 1000). Carrier infection was suspected at each place and fly infection also at Nowshera. There was an increase in the prevalence of dysentery (8·2 admissions per 1000), the quinquennial ratio (1911-15) having been 6·0

per 1000 (though the ratio for 1906–15 was 9·1); it prevailed chiefly in Southern India, as at Bangalore, where there were 24 4, and at Secunderabad 23·5 admissions per 1000. Plague caused 8 admissions and 4 deaths; 4 of the cases occurred at Poona, none of which were fatal. For cholera there were 50 admissions and 19 deaths; 8 of the cases (with 5 deaths) occurred at Meerut. The incidence of venereal disease was higher (36·8 per 1000) than in 1915, but lower than in any previous year in recent times; for the decennium 1906–1915 it has averaged 66·3. At Calcutta the admissions were 151·1 and at Bombay 114·5 per 1000; while, on the other hand, at Lucknow this ratio was 47·9, at Jubbulpore 42·4, and at Rawalpindi 37·1 per 1000. Some explanation should surely be forthcoming as to these wide variations in prevalence. At Poona (where the venereal admission ratio was 54·6 per 1000) it was noted that 50 per cent. of the infection had been contracted in the United Kingdom, France, or Egypt. Heat-stroke (including sunstroke) accounted for 347 admissions and 45 deaths, giving ratios of 5·8 and 0·74 per 1000 respectively. At Ferozepore there were 94 6 admissions per 1000 for this casualty, at Lahore 62·0, at Multan 32·7. A large number of cases (136) occurred on a troop train travelling between Karachi and Peshawar in June, which were admitted to various hospitals en route; 19 of these were fatal. The mortality ratio for all India from this cause (0·74 per 1000) was more than double that for the decennium 1906–15, which had been 0·35 per 1000. Thirty-five victims of dog-bite were treated at the Pasteur Institutes at Kasauli and Coonoor; only 2 cases of hydrophobia occurred; one was treated at Kasauli, but subsequently developed the disease and died; the other, also a fatal case, who had been bitten by his own dog, did not report sick until the disease had developed.

Health of the Indian Army.

The average strength of Indian troops, including 2531 in China, Ceylon, and Somaliland (but excluding those on field service) was 139,076. The ratio of admissions to hospital was 757·4 per 1000, the constantly sick 37·7, and the deaths and invaliding 8·97 and 24·5 per 1000 respectively. All these ratios, except that for invaliding, were higher than in the previous year, and all were very considerably in excess over the quinquennial averages for 1910–1914, when the admissions averaged 546·9, the constantly sick 20·7, the deaths 4·39, and the invaliding 5·39 per 1000. There was a notably increased prevalence of malaria, venereal disease, dysentery, and pneumonia. For malaria the admission and death-rates were 200·7 and 0·69 per 1000 respectively; at Miranshah the admissions were as high as 1710·9 per 1000, the cases being mostly of the malignant tertian type. There was, however, much less pyrexia of uncertain origin (12·4 admissions per 1000, compared with 22·3 in 1915), and sand-fly fever (6·8, compared with 13·9). There were 86 cases of plague, 38 being fatal, the ratios per 1000 being 0·6 and 0·27 respectively; small outbreaks occurred at Poona (11·2 per 1000), and at Pindi (7·3 per 1000), the death ratios being 3·50 and 3·80 respectively. The most fatal disease attacking Indian troops was, as usual, pneumonia (16·9 admissions and 3·35 deaths per 1000); in the Peshawar Division these ratios were 23·7 and 5·57, both much in excess over recent years. Pulmonary tubercle caused 2·8 admissions, and 0·42 deaths per 1000, being most prevalent in the Gurkha regiments, where the admissions were 4·2 per 1000.

Health of the General Population.

The dry weather of the first four months of 1916 affected the wheat crops, especially in the unirrigated areas of the west and north-west; but the rice crops were the highest on record. A further decline in the birth-rate (37·13 per 1000, compared with 38·87 for the preceding quinquennium) applies to the greater part of the country, but not to Madras Presidency, the Punjab, or Lower Burma. The total death-rate of 29·10 per 1000 is slightly lower than that of the preceding quinquennium (30·08). Considerably more than half the deaths (17·13 per 1000) are returned under the head of "fevers," a very vague term. The highest mortality ratio occurred in the Central Provinces and Berar (39·95), the lowest (21·90) in Madras Presidency. Cholera prevailed in the Central Provinces (2·82 deaths per 1000), Bihar and Orissa (2·60), and Assam (2·16); for the whole country the death ratio was 1·21 per 1000. Plague was most severe in Bombay Presidency (4·06 deaths per 1000) and in the Central Provinces (2·06). Taking India as a whole, it was a mild plague year.

The jail sickness and mortality ratios (594 admissions to hospital and 19·78 deaths per 1000) were somewhat in excess of the decennial averages of 584·4 and 19·11 (1906–15), and of those for 1915 (586·1 and 18·74 per 1000). There was great variation in the statistics of different jails: in Bengal the admissions to hospital were 1113·3 per 1000, in Madras they were only 262·8, and in Burma 301·0 per 1000. The death-rates also varied greatly between 60·72 in the North-West Frontier jails and 13·18 in Madras. In Assam jails the improvement has been most marked; for the decade 1906–15 the mortality had averaged 36·87 per 1000; in 1916 it was only 18·97. Sanitary improvements are in progress at Delhi, now the capital of India, and the municipal boundaries of the city have been extended. Pathological and research work in various directions is carried out at the Central Research Institute and at the various Pasteur Institutes, the King Institute, Madras, and the Bombay Bacteriological Laboratory.

This valuable report is submitted by Major F. Norman White, C.I.E., I.M.S., Officiating Sanitary Commissioner with the Government of India, who succeeded Major W. W. Clemesha, I.M.S., in 1917.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Coming Congress of Surgery.

THE Twenty-seventh French Congress of Surgery will meet in Paris from Oct. 7th–10th next in the large amphitheatre of the Faculty of Medicine. Three subjects appear on the agenda, but on this occasion without preliminary abstract—viz.: (1) extraction of intrathoracic projectiles; (2) treatment and remote results of gunshot lesions of the nerves by projectiles; (3) esquillectomy and repair of bony loss.

Serum-therapy of Gas Gangrene.

At the same time that Professor Vincent acquainted the Academy of Science with his discovery of a new preventive serum for gas gangrene the Society of Surgery took a keen interest in the question and several communications were made to it upon the subject. M. P. Duval and M. Vaucher employed at one and the same time on a series of patients three serums, prepared from the bacterial agents commonly met with in this deadly complication—viz., *B. perfringens*, *B. œdematiens*, and the septic vibrio. The serums were prepared at the Pasteur Institute by M. Weinberg and M. Séguin. The injections were first made in the case of 50 men whose wounds seemed most likely to incur the danger of gangrene, and were administered on an average 5–6 hours after receipt of the wound, occasionally 10, 12, or even 18 hours after. None of these cases contracted gas gangrene; 25 died in the first 24 hours owing to the severity of the injury, but without sign of gangrene. None of those who recovered had symptoms of gangrene. After the battle of Flanders 37 men were treated in similar wise on an average 16 hours after being wounded. The three serums were injected at the same time in equal doses of 10–30 c.cm. A first group of 21, whose wounds, though grave, were in good condition, recovered without incident. Another series, who did not arrive at the field hospital until 20 hours after being wounded and whose wounds were already copiously infected, gave the following result: 2 deaths from streptococcal septicæmia without gas gangrene; 4 with wounds in very bad condition in which gas gangrene developed, of which 2 died, and 2 recovered after fresh injections of serum; 2 more seriously wounded and inoperable on arrival who died in spite of large injections. These two authors concluded in favour of the method, used as a complement to surgical operation. Professor Delbet reported on a case of antigangrenous serum-therapy with recovery in the case of a patient reaching hospital with gangrene of 24 hours' duration. He is satisfied that serum-therapy on the lines described is a most effective measure. M. Veau and M. Baudet reported each a similar case. M. Rouvillois has employed serums prepared from *B. bellonensis* and the septic vibrio. Among 12 cases of gangrene not treated with serum only one recovery occurred, and that one following operation; 25 other cases were treated with serum, of which 5 died of wounds without evidence of gangrene, while of the remaining 20 14 recovered and 6 died.

Aviators' Heart.

M. G. Etienne and M. Lamy, of Nancy, have systematically examined with the aid of radioscopy the hearts of a series of aviators, finding evidence of the existence of considerable hypertrophy. The hypertrophy sets in early, being demonstrable after five months of flying, and persists even in the case of aviators who had long ceased to fly. Its degree is roughly proportional to the altitude habitually reached. Simple examination on the screen serves to distinguish between chasers and bombers flying at 5000–6000 metres, and pilots and machine-gunners keeping within the 1000–3000 metre limit. The hypertrophy is progressive, beginning with a phase of rapid development, remains of moderate degree, and involves principally the left ventricle. Compensation nearly always remains perfect. The maximum tension is slightly raised in proportion to the increased muscular strength of the heart; the minimum tension remains normal. This cardiac hypertrophy is practically a physiological adaptation brought about by the effort of the heart to adapt itself to circulatory modifications, especially those of vascular pressure, determined by the varying conditions of the atmosphere crossed in flight, and by the incidents of aviation in general.

August 19th.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

SUBSCRIPTIONS TO THE SECOND APPEAL.

THE following subscriptions and donations to the Fund have been received during the week ending August 17th:—

	£	s.	d.		£	s.	d.
Dr. Alfred Cox (monthly)	1	1	0	Dr. J. R. Keith	1	0	0
Lt.-Col. W. M. Dawson, R.A.M.C.	2	2	0	Capt. H. E. H. Oakeley, S.A.M.C.	10	0	0
Dr. S. W. Carruthers ...	1	1	0	Capt. R. M. Stewart, R.A.M.C.	1	1	0
Dr. F. S. Palmer	2	2	0	Dr. Percy Hughes† ...	3	3	0
Messrs. Steel Brothers and Co., Ltd.*	105	0	0	Dr. W. H. Rowlands† ...	2	2	0
Sir James Barr	5	5	0	Dr. C. L. Hawkins† ...	2	2	0
Staff-Surg. W. Kenneth Wills, R.N.V.R.	5	0	0	Dr. Ambrose†	2	2	0
Messrs. Burroughs Wellcome and Co.	100	0	0	Dr. Williams†	1	1	0
Dr. H. E. Belcher	2	2	0	Dr. Coaker†	1	0	0
Dr. L. B. Poole	2	2	0	Mr. Beilby†	1	1	0
				Small sums†	0	11	0

* Per Dr. Herbert Spencer.

† Collected by Dr. Cameron Kidd.

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W. 1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

A. Patton to be temporary Surgeon.

ROYAL NAVAL MEDICAL RESERVE.

To be temporary Dental Surgeons: J. G. Townsend, W. G. Bowie, G. K. MacLennan.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. W. Bennett to be temporary Colonel whilst employed as Assistant Director of Medical Services of a Division.

Temp. Major A. Chartres to be acting Lieutenant-Colonel while in command of a Medical Unit.

Major J. A. Anderson to be temporary Lieutenant-Colonel whilst specially employed.

Temp. Major A. W. Nuthall (Capt., R.A.M.C. (T.F.)) relinquishes his temporary commission on re-posting.

H. E. Durham to be temporary Major whilst specially employed.

R. S. Turton and T. W. Shaw to be temporary Majors.

Temporary Lieutenants to be temporary Captains: G. A. Ticehurst, H. Holt, J. Raffan.

Late temporary Captains granted the honorary rank of Captain: T. MacHardy, H. W. Ward, J. H. Paterson, L. M. Davies.

To be temporary Captains: A. M. Ross, W. Edgecombe, E. F. Buckler, J. McI. Falkiner, J. B. O. Richards (late Captain, Devon Regt.), Hon. Capt. M. R. MacKay, D. Cotterill, G. Birch, Hon. Capt. V. M. Fisher, O. G. Morgan, J. A. Hadfield, R. L. Moorhead (late Surgeon-Captain, Yeo., T.F.), temp. Lieut. R. A. Attridge.

Temp. Hon. Lieuts. J. F. Harvey and J. V. Ricci to be temporary Honorary Captains.

To be temporary Lieutenants: A. C. Brown, W. N. Leak, C. J. L. Palmer, C. V. Macnamara, R. Price, J. Butterworth, J. Paxton, E. H. Milson, O. H. Woodcock, P. C. MacRobert, J. Clarke, J. Good, Z. M. H. Ross, T. S. Macaulay, J. M. Reid, G. H. Dunn, J. C. Carr, F. McF. Fellows, G. Smith, H. S. Roberts, C. M. Smith, W. G. MacArthur, V. D. Pennefather, I. Clarke, L. P. MacK. Gardner, N. B. Benjafield, A. G. L. Smith, R. M. Rendall, J. McClellan, B. D. Merrin, J. L. Phibbe, J. A. Aitken, B. Blacklock, A. P. Mitchell, R. Clark, G. H. Dart, O. Marriott, S. McClure, J. C. Warrick, G. B. Woodroffe, A. E. Hodgkins, H. P. Fairlie, R. W. Gilmour.

S. A. Moor to be temporary Honorary Lieutenant.

V. P. G. Pedrick, late temporary Lieutenant, to be honorary Lieutenant.

Temp. Lieut.-Col. R. B. Graham (Lieut.-Col., ret., T.F.) relinquishes his temporary commission.

Officers relinquishing their commissions: Temp. Majors H. C. T. Langdon and S. R. Scott. Temp. Capts. H. J. Norman, A. McP. Warner, W. Clow (on appointment under the Ministry of National Service), A. Paterson, W. J. Macdonald, H. F. MacKendrick, O. De Muth, J. B. Anderson, H. G. Coulthard, T. H. Crews, S. Waddell, R. R. Scott, E. H. Lawson, S. H. Calnek, C. G. Sutherland, H. B. Lawson, A. M. Cowie, G. M. DeVine, D. S. Page (on account of ill-health and are granted honorary rank of Captain), W. C. Mayo, R. H. Dix and R. P. Kennedy (on account of ill-health contracted on active service and are granted the honorary rank of Captain), J. Mitchell (on account of ill-health caused by wounds received in action). Temp. Lieuts. R. J. Archibald and W. M. Hume (on account of ill-health and are granted the honorary rank of Lieutenant), and G. S. Ewen.

SPECIAL RESERVE OF OFFICERS.

Lieutenants to be Captains: C. C. Chesterman, J. C. Collins, W. I. FitzG. Powell, C. G. Irwin, J. B. S. Lewis, T. H. McLeod, A. G. E. Wilcock, C. V. Pink, H. W. Leatham, W. G. Woolrich, C. K. Mowll, H. J. C. Churchill, A. O. Bolton, D. Cameron, A. Rose-Innes, J. P. Williams, J. Rowland, H. Gainsborough, R. S. Corbett, I. Braun, R. L. Robinson, J. H. Wiseman, H. G. V. Mence, T. W. Shaw, J. W. Bowman, C. A. Harvey, J. Irvine, J. Kinnear, F. J. Charlton.

Capt. M. W. H. Miles relinquishes his commission on account of ill-health and is granted the honorary rank of Lieutenant.

M. Jackson and G. P. W. Staunton (from University of London Contingent, O.T.C.) to be Lieutenants.

D. O. Macdonald to be Lieutenant.

TERRITORIAL FORCE.

Temp. Hon. Lieut.-Col. E. W. White to be temporary Lieutenant-Colonel.

Major E. J. Maclean to be acting Lieutenant-Colonel whilst specially employed.

Major A. F. Fergus relinquishes his commission on account of ill-health and is granted the honorary rank of Major.

Capt. G. M. A. Thomas relinquishes his commission on account of ill-health and is granted the honorary rank of Captain.

Capts. L. A. Avery and R. Thornton to be Majors.

Capt. (Brevet-Major) C. H. S. Frankau is seconded whilst holding a temporary commission in the R.A.M.C.

Capt. W. A. Phillipps relinquishes his commission on account of ill-health and is granted the honorary rank of Captain.

Capt. W. C. Hodges to be acting Major whilst specially employed.

Capt. (acting Major) L. Milton relinquishes his acting rank on ceasing to be specially employed.

L. F. Wallis, A. R. Ward, A. W. Bartlett, E. Jones, and F. Rae, to be Lieutenants.

Temporary Captains relinquishing their commissions: F. N. B. Smartt, J. Tichborne, R. J. Morgan, H. Whitwell, and P. S. MacLaren, who is granted the honorary rank of Captain.

Temp. Lieut. F. H. R. Heath relinquishes his commission.

Lieut. J. Jackson to be Captain.

Attached to Units other than Medical Units.—Capt. J. D. Wells to be a Deputy Assistant Director of Medical Services, and to be acting Major whilst so employed.

ROYAL AIR FORCE: *Medical Branch.*

H. J. Leviseur (late temp. Surgeon, R.N.), C. L. Birmingham (late temp. Lieutenant, R.A.M.C.), H. L. H. Greer (late Captain, R.A.M.C.) are granted temporary commissions as Captains.

The undermentioned are granted temporary commissions as Lieutenants: N. Homewood, R. G. J. McCullagh, S. A. Nield-Faulkner, P. C. Parr, N. Rumboll, G. Meadows, T. Montgomery, V. A. Spong.

INDIAN MEDICAL SERVICE.

Col. C. R. M. Green has been appointed to succeed Col. Robinson as Inspector-General of Civil Hospitals in the Central Provinces.

Lieut.-Col. A. D. Jameson, R.A.M.C., has been appointed to succeed Major F. W. W. Dawson, R.A.M.C., Commandant of the Rangoon Station Hospital, who has left Rangoon on transfer in command of a hospital ship.

Major N. Walker, Professor of Medicine at the King George's Medical College, Lucknow, has been posted to Mussoorie as Civil Surgeon; Major J. W. D. Megaw, the Principal of the College, will act as Professor of Medicine in addition to his other duties.

Major R. A. Needham has been appointed Assistant Director-General (Sanitary) at Headquarters, and Major H. Ross succeeds him as Assistant Director-General (Stores).

Lieut.-Col. S. C. Evans has been appointed to act as Principal, Grant Medical College, in addition to his own duties.

URBAN VITAL STATISTICS.

(Week ended August 17th, 1918.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had steadily declined from 21·1 to 10·4 in the five preceding weeks, was again 10·4 per 1000. In London, with a population slightly exceeding 4,000,000 persons, the death-rate was 9·8, or 0·7 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 4·9 in Carlisle, 5·0 in Wallasey, and 5·1 in Hornsey, to 17·3 in St. Helens, 18·5 in West Hartlepool, and 25·0 in Barnsley. The principal epidemic diseases caused 289 deaths, which corresponded to an annual rate of 0·9 per 1000, and included 168 from infantile diarrhœa, 36 each from measles and whooping-cough, 31 from diphtheria, 8 from scarlet fever, and 4 from enteric fever. During the past five weeks the deaths from

diarrhœa have shown a progressive increase, but were below the numbers recorded in the corresponding period of last year. The 739 cases of scarlet fever and 903 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were 7 and 1 below the respective numbers remaining at the end of the previous week. Of the total deaths in the 96 towns 116 resulted from violence. The causes of 33 deaths were uncertified, of which 8 were registered in Liverpool and 5 in Birmingham.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality was 10·0, against 13·1 and 11·8 per 1000 in the two preceding weeks. The 233 deaths in Glasgow corresponded to an annual rate of 10·9 per 1000, and included 27 from infantile diarrhœa, 6 from whooping-cough, and 3 from diphtheria. The 51 deaths in Edinburgh were equal to a rate of 8·0 per 1000, and included a fatal case each of whooping-cough and diphtheria.

Irish Towns.—The 135 deaths in Dublin corresponded to an annual rate of 17·6, or 2·3 per 1000 above that recorded in the previous week, and included 22 from infantile diarrhœa, 2 from whooping-cough, and 1 from enteric fever. The 118 deaths in Belfast were equal to a rate of 15·7 per 1000, and included 13 from infantile diarrhœa, and 1 each from enteric fever and whooping-cough.

VITAL STATISTICS OF LONDON DURING JULY, 1918.

IN the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious disease it appears that the number of persons reported to be suffering from one or other of the ten diseases specified in the table was equal to an annual rate of 3·5 per 1000 of the population, estimated at 4,026,901 persons; in the three preceding months the rates had been 3·9, 4·1, and 4·5 per 1000. The lowest rates in July were recorded in Chelsea, the City of Westminster, Hampstead, Islington, Stoke Newington, Holborn, and Wandsworth; and the highest rates in Shoreditch, Bethnal Green, Stepney, Southwark, Bermondsey, and Greenwich. One case of small-pox was notified during the month, against 5, 21, 4, 3, and 0 in the five preceding months; this case belonged to Islington. The prevalence of scarlet fever was about 15 per cent. less than in the preceding month; this disease was proportionally most prevalent in Kensington, Finsbury, Shoreditch, Southwark, and Deptford. The Metropolitan Asylums Hospitals contained 753 scarlet fever patients at the end of the month, against 898, 786, and 846 at the end of the three preceding months; the weekly admissions averaged 105, against 105, 129, and 127 in the three preceding months. The prevalence of diphtheria was about 25 per cent. less than in the preceding month; the greatest proportional prevalence of this disease was recorded in the City of London, Shoreditch, Bethnal Green, Stepney, Southwark, Bermondsey, and Greenwich. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1358, 1232, and 1179 at the end of the three preceding months, numbered 918 at the end of July; the weekly admissions averaged 122, against 143, 202, and 165 in the three preceding months. The prevalence of enteric fever was slightly less than in the preceding month; of the 35 cases notified in July, 4 belonged to Hammersmith, 4 to Fulham, 3 to St. Marylebone, 3 to Hackney, and 3 to Lambeth. There were 23 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 23, 32, and 40 at the end of the three preceding months; the weekly admissions averaged 4, against 3, 5, and 6 in the three preceding months. Erysipelas was proportionally most prevalent in St. Marylebone, Shoreditch, Bethnal Green, Poplar, Southwark, and Camberwell. The 12 cases of puerperal fever included 5 in Lambeth. Of the 18 cases of cerebro-spinal meningitis 3 belonged to Battersea, 2 to Poplar, and 2 to Wandsworth; while of the 7 cases of poliomyelitis 2 belonged to St. Marylebone and 2 to Bermondsey.

The mortality statistics in the table relate to the deaths of persons actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the five weeks ended August 3rd the deaths of 5724 London residents were registered, equal to an annual rate of 14·8 per 1000; in the three preceding months the rates had been 17·1, 13·7, and 11·8 per 1000. The death-rates ranged in July from 9·9 in Wandsworth, 10·0 in Lewisham, 10·8 in Hampstead, 11·6 in the City of London, 12·0 in Kensington, and 12·1 in Paddington, to 18·0 in Greenwich, 18·6 in Finsbury, 19·1 in Bethnal Green, 19·9 in Bermondsey, 20·4 in Holborn, and 21·4 in Southwark. The 5724 deaths from all causes included 376 which were referred to the principal infectious diseases; of these, 139 resulted from measles, 13 from scarlet fever, 48 from diphtheria, 129 from whooping-cough, 4 from enteric fever, and 43 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded during the month in the City of London. Among the metropolitan boroughs the lowest death-rates from these diseases were recorded in Kensington, Hammersmith, Deptford, and Lewisham; and the highest in Finsbury, Bethnal Green, Southwark, Bermondsey, Lambeth, and Greenwich. The 139 deaths from measles were 34 above the average number in the corresponding period of the five preceding years; this disease was proportionally most fatal in Fulham, St. Pancras, Bethnal Green, Southwark, Bermondsey, Lambeth, and Greenwich. The 13 fatal cases of scarlet fever were 4 below the average number, and included 4 in Lambeth, 2 in Kensington, and 2 in Southwark. The 48 deaths from diphtheria exceeded the average number by 2, and included 6 in Stepney, 5 in Islington, 4 in St. Pancras, 4 in Lambeth, 4 in Camberwell, and 3 in Hackney. With the exception of the preceding month, the mortality from whooping-cough was considerably lower than in any other month of the year, the deaths numbering 129 against an average of 58; this disease was proportionally most fatal in Paddington, Fulham, Finsbury, and Southwark. The 4 deaths from enteric fever were 6 less than the average; of these 2 belonged to Camberwell. The 43 fatal cases of diarrhœa and enteritis among children under 2 years of age were less than a third of the average; 5 deaths belonged to Bermondsey, 4 to Islington, and 3 each to Kensington, Southwark, Wandsworth, Camberwell, Greenwich, and Woolwich. In conclusion, it may be stated that the aggregate mortality in London in July from these principal infectious diseases was 3 per cent. below the average.

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING JULY, 1918.

(*Specially compiled for* THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1917.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.								Deaths from all causes.	Death-rate per 1000 living.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	4,026,901	1	535	599	—	35	1	12	142	18	7	1350	3·5	—	139	13	48	129	4	43	376	1·0	5724	14·8
West Districts:																								
Paddington	122,507	—	8	23	—	1	—	1	3	—	—	36	3·1	—	2	—	1	7	—	—	10	0·9	142	12·1
Kensington	161,535	—	31	6	—	1	—	—	3	1	—	42	2·9	—	1	2	—	1	—	3	7	0·5	174	12·0
Hammersmith ...	114,962	—	11	11	—	4	—	1	3	—	—	30	2·7	—	—	—	—	3	—	2	5	0·5	167	15·2
Fulham	145,186	—	21	11	—	4	—	—	4	—	—	40	2·9	—	7	—	1	8	1	—	17	1·2	184	13·2
Chelsea	57,368	—	4	1	—	1	—	1	1	—	—	8	1·5	—	2	—	—	2	—	—	4	0·7	75	13·6
City of Westminster	122,046	—	3	5	—	1	—	—	3	1	—	13	1·1	—	2	1	1	3	—	1	8	0·7	157	13·4
North Districts:																								
St. Marylebone ...	92,796	—	6	15	—	3	—	1	5	—	2	32	3·6	—	1	—	2	2	—	—	5	0·6	138	15·5
Hampstead	75,649	—	3	11	—	2	—	—	1	—	—	17	2·3	—	—	—	1	3	—	—	4	0·6	78	10·8
St. Pancras	186,600	—	24	35	—	—	—	—	7	1	—	67	3·7	—	15	—	4	5	—	—	24	1·3	294	16·4
Islington	297,102	1	21	34	—	2	—	—	9	1	—	68	2·4	—	2	—	5	11	—	4	22	0·8	452	15·9
Stoke Newington...	47,426	—	2	3	—	—	—	—	—	1	—	6	1·3	—	1	—	—	1	—	1	3	0·7	57	12·5
Hackney	196,598	—	14	24	—	3	—	—	6	1	—	48	2·5	—	1	—	3	5	1	2	12	0·6	252	13·4
Central Districts:																								
Holborn	35,303	—	4	4	—	—	—	—	—	—	—	8	2·4	—	1	—	1	1	—	1	4	1·2	69	20·4
Finsbury	68,011	—	13	7	—	—	—	—	—	—	—	20	3·1	—	3	—	—	6	—	1	10	1·5	121	18·6
City of London ...	16,138	—	—	4	—	—	—	—	—	—	—	4	2·6	—	—	—	—	—	—	—	—	—	18	11·6
East Districts:																								
Shoreditch	89,675	—	19	26	—	—	—	—	8	—	—	53	6·2	—	—	—	2	3	—	2	7	0·8	148	17·2
Bethnal Green ...	107,362	—	19	31	—	1	—	1	5	—	—	57	5·5	—	6	—	1	5	—	2	14	1·4	197	19·1
Stepney	232,010	—	35	69	—	—	—	—	8	1	—	113	5·1	—	8	1	6	3	—	1	19	0·9	372	16·7
Poplar	143,443	—	13	23	—	1	—	—	6	2	—	45	3·3	—	3	—	1	3	—	1	8	0·6	223	16·2
South Districts:																								
Southwark	167,936	—	85	39	—	1	1	1	14	—	—	141	8·8	—	16	2	2	9	—	3	32	2·0	345	21·4
Bermondsey	107,635	—	14	25	—	1	—	—	4	1	2	47	4·6	—	18	1	2	1	—	5	27	2·6	205	19·9
Lambeth	272,038	—	41	28	—	3	—	5	9	—	—	86	3·3	—	19	4	4	9	—	1	37	1·4	404	15·5
Battersea	150,023	—	18	19	—	—	—	—	6	3	1	47	3·3	—	6	1	2	7	—	—	16	1·1	206	14·3
Wandsworth	300,787	—	39	17	—	2	—	1	9	2	—	70	2·4	—	2	—	1	11	—	3	17	0·6	286	9·9
Camberwell	239,461	—	21	41	—	—	—	—	15	1	—	78	3·4	—	10	—	4	7	2	3	26	1·1	354	15·4
Deptford	103,527	—	21	17	—	2	—	—	3	—	—	43	4·3	—	1	1	—	1	—	1	4	0·4	125	12·6
Greenwich	90,440	—	15	20	—	1	—	—	2	1	1	40	4·6	—	5	—	2	4	—	3	14	1·6	156	18·0
Lewisham	161,405	—	7	28	—	—	—	—	4	—	1	40	2·6	—	5	—	1	2	—	—	8	0·5	154	10·0
Woolwich...	131,942	—	23	22	—	1	—	—	4	1	—	51	4·0	—	2	—	1	6	—	3	12	0·9	171	13·5
Port of London ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

Correspondence.

"Audi alteram partem."

THE FUTURE OF THE MEDICAL PROFESSION.

To the Editor of THE LANCET.

SIR,—I am not sure that it is worth while my discussing with Mr. Charles Parker what was the exact position of "the extreme Left party" in medical politics a few years ago. We may take it, however, that Mr. Parker, as an officer of the State Medical Service Association, is an authority on the present position of the party, and I am bound to say that its position, as stated in his letter to you last week, seems less logical and less practical than that which I assigned to it in my recent address on Medicine and the State. In pleading for more satisfactory relations between general practitioners and consultants I pointed out that "competition and coöperation cannot go hand in hand." Mr. Parker seizes on this phrase, states that it expresses a truism of universal application, and claims as a chief advantage of his party's ideals that they will completely abolish competition. But surely if it is now proposed to allow each medical man upon qualification to choose between becoming a whole-time servant of the State or a private practitioner, there will indeed be introduced between these two sections of the profession a very fierce form of competition. How otherwise indeed than by competition to the uttermost is Mr. Parker's belief "that private practice would then die a natural death" to be fulfilled? So long as man is allowed to be possessed of private property and to have any option in its disposal, large numbers of individuals will undoubtedly desire to make use of their wealth in order to purchase the private advice of such medical men as are allowed to compete for practice with the State Medical Service. If the extreme Left party desires to eliminate this form of competition it will be necessary to absorb into the State service every practitioner as and when he is qualified and to protect the service by making it illegal for any other persons to practise medicine.

The policy of the "extreme Left party," as re-stated by Dr. Benjamin Moore and Mr. Parker, is to abolish competition, and they believe that a whole-time salaried service will secure this. But will it? Does it do so in other whole-time salaried services? Is there not competition for more honourable or better paid whole-time jobs? Might there not be competition for less responsibility and lighter work? Might not a salaried doctor by cultivating the smiles of his Administrative Board instead of his patients compete with his fellows for early promotion? Might he not by want of sympathy and indifference to his troublesome patients and by constant reference to a higher authority compete with his more conscientious colleagues for ampler leisure to devote to scientific research or even to recreation? Elimination of competition is a party shibboleth, which, human nature being what it is, is not within our capacity to attain. In our present attempt to reconstruct medicine we shall be seriously handicapped if we follow any such will-o'-the-wisp. Let us by all means endeavour to eliminate obviously evil forms of competition such as underselling, profiteering, and qualified quackery, but let us recognise that amongst the most honest and honourable men there must always exist varying powers which may justifiably be used to increase one's opportunity of useful service.

My contention that coöperation and competition cannot go hand in hand as the basis of the relationship between consultants and general practitioners is founded on actual experience of everyday conditions. Few general practitioners will deny that they are constrained from seeking specialist advice for their patients, on every occasion when they would value it, by the fact that most specialists undertake independent, as well as consultative, practice, and thereby place themselves in competition with general practitioners. Few specialists will deny that they would prefer always to act in coöperation with a general practitioner, if by so doing their professional time were sufficiently occupied and an adequate income could be earned. To admit that a mixture of coöperation and competition between these two sections of the profession does not make for the public good, and to urge that in any scheme of reconstruction an attempt should be made to eliminate the competition, is not the same thing as asserting that all professional competition is undesirable. The belief that by proper organisation competition between consultants and general practitioners could be eliminated does not commit one to the proposition that in our present stage of civilisation the total abolition of competition is praticable. Even if total abolition of competition were practicable and desirable a whole-time salaried service would not secure it.

I am, Sir, yours faithfully,

August 11th, 1918. LAURISTON E. SHAW.

40 D.

To the Editor of THE LANCET.

SIR,—The powerful leading article which you publish in your number of August 17th on the subject of 40 D must convince everyone that the maintenance of the law as it at present stands is undesirable. It does not therefore follow that no attempt should be made to attain the object of 40 D by other means; indeed, such an attempt appears imperative in the interest of public health. May I suggest an alternative?

You state that some clinicians go so far as to regard the cure of gonorrhœa in the female as impossible and that the difficulty of a cure is admitted by all. Surely, this leads to the conclusion that we must aim at prevention and not cure. At the present moment facilities for prophylaxis are established for soldiers and very large sections of the male population, and these have diminished in a greater or lesser degree the danger of infection, but in the case of women such facilities either do not exist or are not availed of to any material extent. Are not women entitled to at least equal facilities for the prevention of infection? Indeed, arguing the matter from the national health standpoint, it would be easy to contend that facilities for them should not be equal but greater, as cure in their case is infinitely more difficult, while the presence of disease constitutes among certain classes an infinitely greater danger to the community. It is no argument against this procedure to say that its success will render promiscuous intercourse less dangerous for men, for this result would occur in all events which improve the general exemption from disease.

The main cause of failure, up to recent years, of all attempts to solve the drink problem was the fact that reformers mixed up physiology and morality, and judged physiological measures in the coloured light of their supposed moral effect. Let us not make the same mistake in the case of the venereal diseases. Morality and physiology have both their claims, but they must be treated separately and not in confused conjunction.

I am, Sir, yours faithfully.

August 20th, 1981. X. Y. Z.

HARVEY AND THE PLACE OF PATHOLOGY IN MEDICINE.

To the Editor of THE LANCET.

SIR,—The present-day inadequate instruction in pathology would have been criticised by Harvey. In the first of his Anatomical Exercitations concerning the Circulation of the Blood Harvey says:—

> "And I dare say the opening and dissection of one consumptive person, or of a body spent with some ancient or venomous disease, has more enriched the knowledge of physick than the dissections of ten bodies of men that have been hanged."

This dictum of Harvey, which might well serve for the text of a Harveian orator, has not, so far as I know, received the attention which it deserves. It occurs in a letter to John Riolan, professor and dean of anatomy in the University of Paris, expressing the desire which the publication of Riolan's "Encheiridion" had excited in Harvey to put forth a work on medicinal anatomy similar to Riolan's "Treaties concerning Anatomy and Diseases." Amongst other things, Harvey says, in close connexion with this, that "from pathology the use and art of administering physick, and occasions of inventing many new remedies do occur."

It is clear even at this time, in about 1650, that the man whom Harvey calls "the Prince of Dissectors of Bodies," and the discoverer of the circulation of the blood were at one as to the importance of pathology to the practitioner of

medicine, without depreciating the necessity of a knowledge of anatomy and physiology, but certainly does not place pathology behind them, when he makes this comparison. Indeed, this would seem to be a truism which one would have thought no teacher of any portion of the medical curriculum would have denied, yet it is often denied by the self-styled "pure physician." Even a layman such as Francis Bacon saw this, and in his philosophical work on the Advancement of Science (Bk. II., X. 5) he says:—

"In the enquiry which is made by anatomy (that is, by post-mortem examination), I find much deficience: for they enquire of the parts and their substances, figures, and collocations; but they enquire not of the diversities of the parts, of the secrecies of the passages and the seat or nestling of the humours, nor much of the footsteps and impressions of diseases. And for the humours, they are commonly passed over in anatomies as purgaments, whereas it is most necessary to observe what cavities, nests, and receptacles the humours do find in the parts with the differing kind of humour so lodged and received. And as for the footsteps of diseases .....they ought to have been exactly observed by a multitude of anatomies and the contribution of men's several experiences. ..... I will not doubt to note as a deficience that they enquire not the perfect cures of many diseases, or extremities of diseases, but pronouncing them incurable do enact a law of neglect, and exempt ignorance from discredit."

These words of Bacon apply especially to the so-called practical pathology as taught nowadays, in which considerable attention is paid to staining methods and the examination of microscopic sections, while true experimental pathology is hardly taught at all. In fact, I doubt whether there are any teachers of pathology who are aware of the possibilities of instructing the student in experimental pathology by the use of decerebrate animals. To those unaware I would suggest that they should study the course of experimental physiology as carried out in the University of Oxford, and would counsel them to adapt it to the course of experimental pathology.

But even at the present time there are several learned institutions in which the time devoted to the teaching of pathology is hopelessly insufficient, and proposals for its increase meet with opposition, and consideration of the matter is deferred for the duration of the war, as if the war could make any difference as to the amount of teaching required in any particular subject. One might as well defer all alterations in teaching until the war is over on this line of argument. That would be recognised as an obviously silly proposition, yet the other is on a level with it.

Some years ago I took the trouble to inquire of various universities the amount of time which was devoted to the teaching of this subject. The result obtained was approximately as follows:—

Leeds	120 hours.	Cambridge ...	200 hours.†
Liverpool	140 ,,	Birmingham ...	220 ,,
Guy's Hospital	160* ,,	Oxford	250 ,, about.
Manchester	170 ,,	Edinburgh ...	300‡ ,, ,,
Glasgow...	180 ,,		

* Plus extra for University candidates. † For Part I. pathology only.
‡ Two hours daily during three terms.

It was difficult to ascertain the amount of time spent in the dead-house, and it seemed occasionally not to be actually, even if it was nominally, compulsory.

In other medical subjects at Leeds (I quote Leeds as being the University with which I am best acquainted):—

Physiology ...	310 hours.	Surgery*	900 hours.
Anatomy	800 ,, about.	Gynæcology*	450 ,,
Medicine*... ...	900 ,,	P.M.	50 ,,

* Exclusive of school lectures.

Roughly, the estimation in which the degrees of these bodies are held may be said to be in proportion to the time spent on pathology.

In estimating the value of Harvey's opinion in this matter it is to be remembered that he was professor of anatomy and surgery at the Royal College of Physicians and also physician to the King, and consequently of considerable clinical experience and practice. Conversely, many physicians of repute have also been expert pathologists—for instance, Addison, Bright, Moxon, Goodhart, Bristowe, and many others.

If we regard, as Harvey also does, physiology as the science of health and pathology as the science of disease, there does not appear to be any reason why more time should be devoted to the former than to the latter in the medical curriculum. Nor is there any reason why the *art* of medicine should receive such a comparatively excessive amount. I mean by that excessive beyond the *science* of disease; it is not excessive for what is required, as seen by the above table. Inasmuch as pathology covers a similar area of knowledge as physiology or anatomy, there is no ground for supposing that the acquisition of this necessary knowledge would take less time in one case than in the other.

I plead, then, for more extended teaching of the subject which Harvey calls "the doctrine of diseases" (i.e., pathology) "by which actions of the body are hurt." "In this range sickness and its causes and accidents are handled, but the physician performeth his cure by preserving health and restoring it (if it so please God) when it is lost."

I am, Sir, yours faithfully,

August 10th, 1918. A. S. LEYTON.

WAR DEAFNESS.

To the Editor of THE LANCET.

SIR,—In your last issue Major Hurst, R.A.M.C., has criticised the article by Dr. Logan Turner and myself on "War Deafness." Nothing would please me more than to find that we have been unduly pessimistic, but, on the other hand, nothing adduced by Major Hurst has in the smallest degree affected my belief in the accuracy of the conclusions we have arrived at by clinical study of a large number of cases.

Major Hurst says, "My own 'opportunities of studying ear diseases' before the war were fortunately nil, and I was therefore able to face the problem of war deafness with an unprejudiced mind." Now from his letter I much fear that he has not studied the question from a scientific point of view even now, and that, as a consequence, his mind has remained not only unprejudiced but uninformed. To be perfectly candid, it occurred to me on first reading his letter that it required no reply, because it consisted of statements resting not upon the production of a definite series of properly observed cases but upon an *ipse dixit* and a certain number of inaccuracies. On consideration, however, it suggested itself to me that some of your readers might not compare our original paper with Major Hurst's letter, and might in consequence be influenced by the views he has expressed, so for this reason it has seemed necessary to reply.

To put the matter briefly, general statements are not of the slightest value in a controversy of this kind, and unless Major Hurst is able to produce a series of cases in support of his views these views will remain valueless. If and when he does so we shall all no doubt be prepared to give them the attention they deserve.

If he will consult otological literature Major Hurst will be able to convince himself of the fallacy of his statement that "it is very unlikely that the cochlea should be so damaged that complete deafness results without the adjacent semicircular canals being affected." I fear that his criticism of our two cases in which he has arrived at a diagnosis of hysterical deafness is rather characteristic of his methods. In one of them the injury which produced the deafness (Case 1, Group D) caused perforation of the tympanic membrane as well as a concussion lesion of the cochlear apparatus. Does he then think that the objectively demonstrable middle-ear suppuration was also hysterical, and if not, why not? Of course, I do not deny that hysterical deafness may occur in soldiers who have been exposed to shelling, only I believe it to be rare, and I hold that the cases recorded by Dr. Logan Turner and myself have proved that vestibular tests are not of great value in diagnosing between functional and organic deafness.

I am, Sir, yours faithfully,

Edinburgh, August 18th, 1918. P. MCBRIDE.

THE DISAPPOINTMENTS OF VACCINE THERAPY.

To the Editor of THE LANCET.

SIR,—I have read without surprise Dr. H. G. Adamson's paper with the above title in your issue of August 10th. His disappointment in the therapeutic results of vaccine therapy is, from the quotations he gives, evidently shared by Sir Almroth Wright, and, indeed, is general amongst those who follow the orthodox method of administration.

I have frequently pointed out during the last 13 years the common causes of failure. Let me repeat them:—

1. Inadequate dosage.
2. The use of the wrong or bad antigen.
3. Bad spacing of the doses.
4. Very rarely, incapacity of the patient to react.

Dr. Adamson says he rarely cures a case of sycosis barbæ or of acne vulgaris. I very rarely fail to do so. I may say the same of gonorrhœa, gleet, and lupus. These last three are practically always mixed infections, so that a single antigen is not likely to succeed. I have had the most rapid and dramatic results in two cases of paratyphoid B and three of *B. typhosus* infection, but again not with the specific antigen alone; it is necessary to include the patient's *B. coli* as well.

As to the dangers of abnormal reaction they are chimerical, as they can be controlled by the exhibition of iodine.

I ask Dr. Adamson to read my book "Therapeutic Immunisation" and to try again. I shall be much surprised if he does not get greatly improved results. I always feel myself that if I fail it is generally my own fault, that I have missed some essential microbe or that I have failed to adapt my immunisation to the reactivity of the patient. I am not so foolish as to think that the use of vaccines precludes the use of other methods of treatment, on the contrary; but I know that by its means results can be attained which can be obtained by no other known method.

I am, Sir, yours faithfully,

University College, Dublin, August 17th, 1918. W. M. CROFTON.

TRANSIENT HEMIPLEGIA.

To the Editor of THE LANCET.

SIR,—Enjoying a brief holiday, I have only just read the clinical note and your annotation upon my case of transient hemiplegia. The cerebro-spinal fluid was not examined, as owing to the rapid recovery of the patient to a condition of good health one did not feel justified in pursuing a very active investigation. There are none of the usual evidences of arterio-sclerosis, although an interesting cardiac condition was verified by autopsy in the patient's father, who died at a comparatively early age.

If I may say so, this case illustrates fully the need of a better coördination of work, happily called "team-work" by Sir Bertrand Dawson in his recent and most opportune manifesto. Many of his suggestions were published in the memorandum of the London Local Medical and Panel Committee in June, 1917. Those ideas were dominant in the minds of those who, in 1912, urged the profession to accept the modified terms of the National Insurance Act as a first great instalment of State coöperation, as applied to civilian medical services. The principle of mutual aid which the words "team-work" so happily express seems to me the only hope for both humanity and civilisation.

I am, Sir, yours faithfully,

Studland, Dorset, August 20th, 1908. H. H. MILLS.

A NEW REFLEX SIGN IN SPASTIC PARAPLEGIA.

To the Editor of THE LANCET.

SIR,—In THE LANCET of June 1st last, on p. 777, there appeared an editorial note under the above heading. The sign has been described recently by Dr. Bing, the neurologist of Basle, and consists of *plantar* flexion of the ankle when the *dorsum* of the foot is struck at any point along an imaginary line between the malleoli. It is stated that the sign occurs constantly in organic spastic conditions of the lower extremities, and that Dr. Bing claims that this "paradoxical" Achilles jerk can be elicited in cases in which the more common reflex signs of spasticity from cortico-spinal impairment appear to be absent.

Since June 1st I have made a point of testing this sign in every one of a large number of patients and I have found that, whereas it is certainly present in the conditions mentioned above, it is present also in cases of non-organic disease in which the tendon-jerks are exaggerated, and also in a considerable proportion of cases which, to my examination, are neurologically normal.

The matter can readily be tested by everyone for himself, and I think that it will be found that the sign has not quite the significance which has been claimed for it by its distinguished describer and by the author of your note.

I am, Sir, yours faithfully,

HILDRED CARLILL, M.A., M.D., M.R.C.P.,
Neurologist to the Royal Navy; Assistant Physician, Westminster Hospital, &c.

R.N. Hospital, Haslar, August 17th, 1918.

The War.

THE CASUALTY LIST.

THE following medical officers appear among the casualties announced since our last issue:—

Killed.

Capt. W. H. Lister, D.S.O., M.C., with bars, R.A.M.C., was a student at University College, London, and qualified in 1913. At the time of the outbreak of war he was holding an appointment at University College, which he at once resigned, and joined up. He saw service in France and in Italy, in which latter country he was killed. In the Balkan War he served as a dresser in the British Red Cross Unit with the Greek army, for which he was awarded the Balkan Medal. The awards of the D.S.O., the M.C., and bars were recorded in THE LANCET respectively of June 26th, 1915, p. 1373; Oct. 28th, 1916, p. 770; Dec. 2nd, 1916, p. 595; and Dec. 22nd, 1917, p. 951.

Capt. G. H. H. Almond, R.A.M.C., received his education at Loretto, at Oxford, and at St. Bartholomew's Hospital, London, and qualified in 1906. After holding appointments at St. Bartholomew's Hospital and at the West London Hospital, he practised at Bath, where he was honorary assistant pathologist at the Royal United and Mineral Water Hospitals. He served in the South African War in a combatant capacity.

Lieut.-Col. A. J. A. Menzies, D.S.O., R.A.M.C., qualified at Edinburgh in 1912, and joined the R.A.M.C. prior to the outbreak of war. At the time of his death he was in command of a cavalry field ambulance. The award of the D.S.O. was recorded in THE LANCET of Nov. 13th, 1915, p. 1112.

Capt. W. H. Lloyd, R.A.M.C., attached London Regiment, was a student at the Middlesex Hospital, London, and qualified in 1915. He joined up shortly afterwards.

Surg. L. A. Martin, R.N., was a student at University College Hospital, London, and qualified in 1912.

Previously Reported Missing, now believed Killed.

Capt. C. W. Bond, R.A.M.C., was a student at St. Mary's Hospital, Paddington, and qualified in 1901. A few years later he qualified in dentistry from the Royal Dental Hospital, London. He took part in the Boer War.

Died of Wounds.

Capt. R. C. Rogers, R.A.M.C., attached H.A.C., qualified at Edinburgh at the close of the year 1914. He held an appointment at the Royal Infirmary in that city prior to joining up.
Capt. M. A. McKechnie, Canadian A.M.C.
Capt. T. Whitmore, Canadian A.M.C.

Wounded.

Lieut.-Col. D. Donald, Canadian A.M.C.
Major J. Hughston, R.A.M.C.
Capt. I. M. Barrow, Australian A.M.C.
Capt. D. St. C. Campbell, Canadian A.M.C.
Capt. E. A. McCusker, Canadian A.M.C.
Capt. J. D. H. W. Barnett, Canadian A.M.C.
Capt. D. A. Morrison, Canadian A.M.C.
Capt. J. A. C. Scott, M.C., R.A.M.C., attd. Durham L.I.

Wounded and Prisoner in German Hands.

Capt. G. Perkins, R.A.M.C.

Previously reported Killed, now reported Prisoner in German Hands.

Lieut. A. M. Clare, R.A.M.C., attached Durham L.I.

Previously reported Missing, now reported Prisoners in German Hands.

Lieut.-Col. A. C. H. Gray, R.A.M.C.
Capt. R. M. Handfield-Jones, M.C., R.A.M.C.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported:—

Second Lieut. J. H. Wybrants, London Regiment, died of wounds, only son of the late Dr. R. B. Wybrants, of Wincanton, Somerset.

Temp. Capt. T. P. Muspratt, M.C., Worcestershire Regiment, died of wounds, second son of Dr. C. D. Muspratt, of Bournemouth.

Lieut. (acting Major) R. H. Collyns, M.E., Royal Engineers, died of wounds, second son of Dr. R. G. Collyns, of Dulverton, Somerset.

Lieut. R. O. C. Macdonald, M.C., R.F.A., accidentally killed whilst flying in England, son of Dr. R. J. J. Macdonald, of Wuchow, China.

Capt. W. B. Young, R.A.F., accidentally killed whilst flying in England, only son of Dr. J. Young, of Earlston, Berwickshire.

T. S. Keith, Cameron Highlanders, killed in action, youngest son of the late Dr. A. D. Keith, of Aboyne, Aberdeenshire.

Surg. L. A. Martin, R.N., accidentally killed at sea, youngest son of Dr. E. F. Martin, of Weston-super-Mare.

Corp. K. A. Clark, killed in action, elder son of the late Dr. A. W. Clark, of Wisbech, Cambs.

Lieut. R. A. Edwards, West Yorkshire Regiment, died of wounds, youngest son of Lieut. E. H. Edwards, R.A.M.C., of Rochdale, and formerly of Tai Yuan Fu, China.

Capt. O. Horsley, M.C. and bar, Gordon Highlanders, attached R.F.C., killed whilst flying in England, youngest son of the late Sir Victor Horsley, of Cavendish-square, London.

THE HONOURS LIST.

The following are the statements of service for which the decorations recorded in THE LANCET of March 9th, 1918, p. 386, were conferred:—

Bar to the Military Cross.

Temp. Capt. GEORGE LESTOCK THORNTON, M.C., R.A.M.C.—For conspicuous gallantry and devotion to duty. After his two orderlies had been killed he continued to attend to the wounded with complete disregard for his personal safety.

Military Cross.

Temp. Capt. ROBERT DANIELS BELL, R.A.M.C.—For conspicuous gallantry and devotion to duty. On the battery positions being heavily shelled with gas shells one shell struck a dug-out occupied by three men, badly wounding two of them and gassing the third. This officer immediately proceeded to their assistance, extricated them from the débris, and proceeded to bind up their wounds, removing his own gas mask in order to see more clearly. The men were successfully evacuated to a dressing station, but he, unable to find his mask, became badly gassed. Despite this he persisted in carrying out his duties for some time until he had to be evacuated. His absolute lack of fear was undoubtedly the means of saving the lives of the three men.

BROUGHT TO NOTICE.

The names of the following medical officers have been brought to the notice of the Secretary of State for War for valuable services rendered in connexion with the war:—

Army Medical Service.—Surg.-Gen. W. S. M. Price.

Royal Army Medical Corps.—Lt.-Col. H. J. Barnes, R.P. (late R.A.M.C.); Temp. Capt. D. J. Bedford; Lt.-Col. U. J. Bourke; Temp. Capt. A. E. Boycott; Temp. Maj. F. S. Brereton; Temp. Capt. R. Bruce-Low; Capt. G. A. Child (T.F.); Temp. Capt. W. A. Clayton; Temp. Capt. F. Corner; Temp. Maj. W. B. Cosens; Temp. Capt. S. E. Denyer, C.M.G.; Temp. Capt. J. Fairley; Capt. R. A. Freeman (T.F.); Temp. Lt.-Col. H. French; Lt.-Col. (temp. Col.) C. T. Green, T.D. (T.F.); Capt. L. C. Hayes; Temp. Hon. Maj. T. G. Hine; Capt. (temp. Lt.-Col.) E. A. Houchin (T.F.); Maj. H. A. Howes (T.F.); Temp. Maj. G. P. Humphrey; Capt. (acting Maj.) A. Jackson; Maj.-Gen. O. R. A. Julian, C.B., C.M.G. (formerly R.A.M.C.); Capt. G. E. Kinnersley; Capt. W. P. MacArthur, D.S.O.; Temp. Capt. E. F. W. Mackenzie, M.C.; Temp. Capt. D. W. Maclagan; Temp. Capt. J. A. Marsden; Capt. (local Maj.) A. T. J. McCreery, M.C.; Lt.-Col. H. M. Nicholls; Capt. G. W. S. Paterson; Temp. Capt. R. A. Peters, M.C.; Temp. Capt. (temp. Maj.) H. T. L. Roberts; Temp. Maj. W. V. Robinson; Temp. Capt. T. Russell; Capt. T. Sheedy (S.R.); Lt.-Col. W. F. Somerville, T.D. (T.F.); Maj. C. B. Turner (T.F.); Temp. Maj. R. Wilson; Capt. C. W. Wirgman (T.F.); Temp. Maj. S. W. Woollett; Lt.-Col. J. R. Yourdi, R.P.

Canadian Army Medical Corps.—Maj. S. C. Chown; Lt.-Col. W. H. Delaney; Lt.-Col. P. G. Goldsmith; Capt. (acting Maj.) J. R. Goodall; Lt.-Col. (acting Col.) L. E. W. Irving, D.S.O.; Col. S. H. McKee, C.M.G.; Lt.-Col. K. D. Panton; Capt. R. L. Warner; Capt. C. R. Wilson; Maj. C. A. Young.

Australian Army Medical Corps.—Maj. (temp. Lt.-Col.) J. K. Adey; Lt.-Col. C. E. Dennis; Lt. Col. W. R. Grigor; Capt. (temp. Maj.) H. O. Lethbridge; Lt.-Col. F. Marshall; Lt.-Col. B. M. Sutherland; Maj. H. H. D. Turnbull; Maj. G. C. Willcocks, M.C.

New Zealand Medical Corps.—Capt. (temp. Maj.) W. Bruce; Capt. D. E. Fenwick; Col. W. H. Parkes, C.M.G.; Maj. T. R. Ritchie; Capt. W. S. Wallis.

South African Army Medical Corps.—Lt.-Col. H. H. Balfour, M.B.E. (temp. Maj., R.A.M.C.); Temp. Maj. J. C. A. Rigby.

United States Medical Corps.—Lt.-Col. W. J. Le H. Lyster.

Jersey Medical Corps.—Maj. A. C. Stamberg (temp. Maj., R.A.M.C.).

Queen Mary's Auxiliary Army Corps.—Dr. A. M. Roberts, Medical Rectg. Controller.

Dr. Mary E. Phillips has been granted permission to wear the Insignia of the Fourth Class of the Order of St. Sava conferred upon her by His Majesty the King of Serbia in recognition of her services with the Scottish Women's Hospitals in Serbia.

THE CHAIR OF SURGERY AT ZURICH.—Professor P. Clairmont, of Vienna, is to succeed Professor F. Sauerbruch as professor of surgery and director of the Surgical Clinic at Zurich.

OBITUARY OF THE WAR.

JOHN DOVER PROUD, M.B., B.S. DURH.,

MILITARY CROSS WITH BAR.

MAJOR, ROYAL ARMY MEDICAL CORPS.

Major J. D. Proud, who died on active service on August 1st, was 26 years of age and the only son of Dr. Frederick Proud, of Maryport. Educated at Charterhouse and Durham University he graduated M.B., B.S. in 1915, and at once joined the R.A.M.C. as a lieutenant in the Special Reserve, from which he later transferred to the Regular Army. Going at once to the Western front he was appointed to a field ambulance attached to a famous Highland division and saw constant fighting for three years. He was awarded the Military Cross in April of last year and a few months later a bar to the cross for conspicuous gallantry and unwearying exertions under heavy fire. He was wounded on July 28th, while acting as bearer officer for the forward clearing of wounded of an infantry brigade, dying at a casualty clearing station four days later.

When a student Major Proud represented his university in all branches of sport, and was a good game shot and keen ornithologist. His colonel writes of him in the field: "He was quite fearless and one of the best officers I have ever had serving under me."

ERIC NEWTON, M.B., CH.B. ABERD.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain E. Newton, who died of wounds in East Africa at the age of 32, had been reported missing since August, 1917, but official intimation of his death was only received recently. He received his early education in India, where his father was a medical officer, continuing at Aberdeen University, and graduating M.B., Ch.B. in 1915. After a brief period as assistant to Dr. A. E. Jones, of Prestwick, he obtained a commission in the R.A.M.C., and was sent out to East Africa in charge of a hospital.

Captain Newton had some reputation as an all-round sportsman. At hockey he was a good full-back, playing on several occasions in international matches, and his quickness and sureness of eye stood him in good stead at lawn tennis and cricket. He was unmarried.

WADE SHENTON GARNETT, M.B., B.S. MELB.,

MAJOR, AUSTRALIAN ARMY MEDICAL CORPS.

Major W. S Garnett, who was recently killed in France, graduated M.B., B.S. at Melbourne University in 1910 with honours and was appointed to the resident medical staff of the Melbourne Hospital for 12 months. Later on he was resident at the Women's Hospital and at the Children's Hospital, where he became senior resident before commencing practice in Prahran. In April, 1916, he enlisted in the A.I.F., going overseas in August. He was for some months

attached to the staff of an Australian general hospital in France, and later was transferred to a field ambulance and then to the 45th Battalion, with which he was serving when he was wounded fatally by a shell whilst dressing men in the open. His loss is keenly felt amongst a large circle of Australians and others.

WILLIAM McCALL, M.B., C.M. GLASG.,
DISTINGUISHED SERVICE ORDER,
LIEUTENANT-COLONEL, ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel W. McCall, who died in the 1st Southern General Hospital at Birmingham in his forty-seventh year, was the elder surviving son of William McCall, of Irvine, Ayrshire. Educated at the Irvine Royal Academy, where he was a medallist, he went on to Glasgow University, where he graduated M.B., C.M. in 1894. Three years later he settled in Birmingham as assistant in a practice which he eventually bought. In 1908 he joined the R.A.M.C. (T.F.) and was attached to the 1st South Midland Field Ambulance. On the outbreak of war he was mobilised with the Territorial Force and given the rank of major. In March, 1915, he was sent to France, and in 1917 was given command of an ambulance with the rank of lieutenant-colonel. Last November he went with his unit to Italy and was stationed for some time in the neighbourhood of Vicenza, his name being included in the New Year's Honours list. In April he was invalided home and underwent an operation from which he never rallied. He is survived by his widow, a son, and two daughters.

Medical News.

MATRICULATION CANDIDATES FROM THE SERVICES.—Candidates who have been on active service during the present war will be admitted to the matriculation examination by the joint board of the Universities of Manchester, Liverpool, Leeds, Sheffield, and Birmingham under the following conditions: Each candidate will be required to apply to the board on an official form, and to supply evidence of qualifications with a statement of the purpose in joining a faculty of a university. The representatives on the board appointed by each of the universities will conduct an examination to ascertain the general standard attained by the candidate, consisting of a *viva-voce* examination, with a general paper and essay to all candidates, and such other papers as they may think desirable. They have power to exempt from the matriculation examination applicants who satisfy them of their general attainments and ability to take the course in the specified faculty with a reasonable prospect of taking a degree. The fee for examination and for certificate of registration is £2, and forms of application may be obtained from the secretary to the board, 24, Dover-street, Manchester.

CIVICS AND EUGENICS AT OXFORD.—On Monday last, August 19th, a Summer School of Civics and Eugenics was opened at Oxford, with a preparatory course dealing with the scientific basis of educational and social work. The second week, beginning on August 26th, will be divided into three courses, dealing respectively with the training of teachers, social workers, and speakers. Among the lecturers for the various courses and lectures are Professor J. Arthur Thomson, Sir Malcolm Morris, Dr. Mary Scharlieb, Major Leonard Darwin, and Professor James Lindsay. The subjects included in the courses are Venereal Disease, Prostitution, Marriage and Social Welfare, and the Life of Women and Girls in Factories. Further particulars may be obtained from the secretary, Civil and Moral Education League, 11, Tavistock-square, W.C. 1.

ARMY PROHIBITION ORDER IN REGARD TO PHENACETIN AND ACETANILIDE.—In exercising the powers conferred upon them by the Defence of the Realm Regulations Act the Army Council have prohibited the sale or supply of phenacetin and acetanilide, and any salts, preparations, derivatives, or admixtures prepared from or with either of the above-mentioned drugs, to or for any member of His Majesty's Forces except subject to certain conditions. This Order adds two more drugs to a growing list of those forbidden to be sold to the Army. The new Order is dated from the War Office, August 8th, 1918, and appeared in the *London Gazette* of August 13th.

PRESENTATION TO A WOMAN DOCTOR.—Dr. Mary Gordon, who was recently appointed senior medical officer to the Johannesburg General Hospital, was the recipient of an address of congratulation from the Women's Suffrage Conference held at Johannesburg on July 5th. As this is the first appointment of a medical woman made at the institution a similar address was sent to the board of the hospital.

BRITISH DENTISTS' HOSPITAL.—This hospital, founded in 1911, to provide treatment by registered dentists for necessitous workers and their families, has just issued its sixth annual report, dealing with the work at its four centres of Camden-road, Lewisham, Clapham, and St. Pancras School for Mothers. The attendances at these centres during 1917 were 2343, 2566, 880, and 201, a total of 5990. Of these, extraction cases totalled 1804 and fillings 1006, scaling 146, dentures 290, dressings, temporary fillings, and root treatment 412, and crowns 12. The receipts were £539, £674, £256, and £484, and the expenses £728, £610, £367, and £416, showing for the four centres (1) a deficit of £189, (2) a surplus of £64, (3) a deficit of £111, (4) a surplus of £68; or a total net deficit on the working of £168. The constitution and by-laws are under process of revision, as decided by the executive committee in the light of the experience they have gained, and a new scale of fees to be charged for the treatment of patients and supplying dentures has been agreed upon. The President of the hospital is Sir Francis Farmer and the Vice-Presidents include Lady Meyer, the Mayor of St. Pancras, and the medical officers of health for Bermondsey and Tottenham. Mr. George Thomson is chairman of the executive committee and trustee. The head offices are at 31, Camden-road, N.W. 1.

PRESENTATION.—Dr. J. Johnston, the author of "Visits to Walt Whitman," an interesting picture of the American poet in his old age, has been presented with the long-service silver medal of the Order of St. John of Jerusalem in England in recognition of his 27 years' service to the St. John Ambulance Association and Brigade. Dr. Johnston was for 12 years an honorary surgeon to the Bolton Infirmary and for 16 months was an officer on the staff of Queen Mary's Military Hospital at Whalley. He holds the St. John Ambulance South African War medal and the Coronation Medal of King George.

DEATH OF DR. W. R. MACDERMOTT, J.P.—The death occurred at his residence, Poyntzpass, on August 9th, in his seventy-ninth year, of a well-known North of Ireland practitioner, Dr. W. R. MacDermott, who had been medical officer of Poyntzpass Dispensary district, co. Armagh, since 1867. Born in co. Meath, the son of a doctor, Dr. MacDermott graduated in the University of Dublin in 1866, and in the same year he obtained the qualification of the Irish College of Surgeons. In 1868 he was elected medical officer of the Poyntzpass district, the duties of which he discharged to the complete satisfaction of everybody, until in January of this year he was laid aside by illness. At the time of his golden jubilee the guardians granted him a substantial increase of salary, and at the time he died he was the oldest dispensary doctor in Ireland. He was the author of two books, "The Green Republic," dealing with the Irish land question, and "Foughilotra," a story laid in the "montiaghs," or boggy districts along Lough Neagh. He also communicated articles at times to such papers as the *Statist* and *Observer*. In all the relations of life he was kind, sympathetic, and respected by everyone.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, LIMITED, London.
Breathing Power. By Haydn Brown, L.R.C.P. Edin. 1s. 6d.
Religio Grammatici. The Religion of a Man of Letters. By G. Murray, LL.D. 1s. 6d.

AMERICAN LARYNGOLOGICAL ASSOCIATION, New York.
Transactions, 1917.

HEINEMANN, WILLIAM, London.
War Nursing. By C. Richet. Translated by Helen de V. Beauclerk. 3s. 6d.

KIMPTON, HENRY, London.
Treatise on Cystoscopy. By G. Luys. Translated by A. L. Wolbarst, M.D.
Roentgen Technic (Diagnostic). By Norman C. Prince, M.D. 2nd

Vacancies.

For further information refer to the advertisement columns.

Abertillery Urban District Council.—M.O H. and Sch. M.O. £500.
Birmingham Education Committee.—Asst. School M.O. £300.
Brighton, Royal Sussex County Hospital.—H.P. £100.
Bristol Royal Infirmary.—H.P. and H.S. £120.
Cheltenham General Hospital.—Res. H.S. £200.
Derbyshire County Council.—Asst. M.O. £400.
Great Northern Central Hospital, London, N.—H.S. £100.
Huddersfield County Borough.—Female Asst. M.O H. £400.
Liverpool, Walton Institution, West Derby Union.—Two Asst. Res. M.O.'s. £330.
London Temperance Hospital, N.W.—Surgical Registrar. 40 guineas.
Manchester Corporation.—Coroner. £1000.
Manchester Royal Eye Hospital.—Sen. H.S. £150.
Metropolitan Hospital, Kingsland-road, E.—H.P. £150.
Nelley, British Red Cross Hospital.—M.O.
Queen Mary's Hospital, Stratford.—H.S.
Rochdale Infirmary and Dispensary.—Jun. H.S. £150.
Sheffield Royal Infirmary.—Res. S.O. £200. Also H.S. £150.
Scottish Women's Hospitals.—Female Surg. C.M.O.
South Mimms, Clare Hall Sanatorium.—Asst. Med. Supt. £300.
Stoke-on-Trent County Borough.—Asst. Tubere. O. £400.
Swansea General Hospital.—H.S. £250.
Walsall General Hospital.—Female Sen. H.S. and Anæs. £250.
Westmorland Consumption Sanatorium.—Sec. Asst. M.O. £200 to £250.
Willesden Urban District Council.—Asst. M.O. £10 10s. per week.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Avoca, Wicklow.

Births, Marriages, and Deaths.

BIRTHS.

BARRINGTON-WARD.—On August 16th, at George-street, Hanover-square, the wife of L. E. Barrington-Ward, F.R.C.S., of a daughter.
DE BOINVILLE.—On August 18th, at South Grange, Aigburth-road, Liverpool, the wife of Captain V. Chastel de Boinville, M.D., R.A.M.C. (T.), of a son.
CROSBIE.—On August 3rd, the wife of Major D. E. Crosbie, M.C., D.A.D.M.S., of a daughter.
RADFORD.—On August 15th, at Saxtead, Marshall's-road, Sutton, to Muriel Radford, M.B. (nee Lloyd), wife of Maitland Radford, M.B.—a daughter.
ROPER.—On August 17th, at Exeter, the wife of Major F. A. Roper, R.A.M.C. (T.), of a daughter.

MARRIAGES.

GRIFFITHS—JAMES.—On August 13th, at Charles-street Congregational Church, Cardiff, Hugh Ernest Griffiths, M.B. Lond., F.R.C.S. Eng., to Doris Eirene, youngest daughter of the late Mr. W. H. James and Mrs. James of Penylan, Cardiff.
IRVING—BRADSHAW.—On August 15th, at Crosthwaite Church, Keswick, Robert James Irving, F.R.C.S., to Violet Dorothy Gwenllian Pole, daughter of Edward H. G. Bradshaw, of Clifton, Bristol.
MALSEED—STUART.—On August 15th, at Waterside Presbyterian Church, Captain Alfred Malseed, M.C., R.A.M.C., attached King's Liverpool Regiment, to Eileen, daughter of the Rev. Dr. and Mrs. Stuart, Clifton Manse, Londonderry.
MILLER—GILFORD.—On August 15th, at St. Luke's Church, Reading, Reginald Miller, M.D., F.R.C.P., to Dorothy, daughter of the late William Gilford and Mrs. Gilford, of Wilmington, Wokingham-road, Reading.

DEATHS.

ALMOND.—Killed in action, August 9th, Captain George Hely-Hutchinson Almond, R.A.M.C., M.A., M.B., B.Ch. Oxon., aged 41, son of the late Hely-Hutchinson Almond, Headmaster of Loretto, and of Mrs. Almond, and dearly loved husband of Violet Almond (nee MacCormac), 6, Brock-street, Bath.
GLASCOTT.—On August 14th, at Rosemullion, Budleigh Salterton, after a very short illness, Charles Edward Glascott, M.D., F.R.C.S., late of Manchester.
LISTER.—On August 9th, killed in action, Captain William Howard Lister, D.S.O., M.C., R.A.M.C., Fellow of University College, London, of Buxton, aged 31.
MENZIES.—On August 9th, killed in action, Lieutenant-Colonel Arthur J. A. Menzies, D.S.O., R.A.M.C., aged 32.
PROCTER.—On August 15th, at Brampton-Kinlet, Canford Cliffs, John Ward Procter, M.R.C.S., L.R.C.P., aged 84.
SCOTT-LAUDE.—On August 14th, at Helensburgh, Henry Scott-Lauder, Deputy Surgeon-General, R.N. (retired), aged 81 years.
WESTON.—On August 12th, after many years' illness, in Devonshire, Arthur Ernest Weston, L.R.C.P. Lond., M.R.C.S. Eng., age 47.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

The following journals, magazines, &c, have been received:—Medical Review, Shield, Bulletin of the Johns Hopkins Hospital, Journal of Nervous and Mental Disease, Middlesex Hospital Journal, Birmingham Medical Review, New Zealand Medical Journal, American Journal of Public Health, Canadian Practitioner, Therapeutic Gazette, Bulletin of the International Association of Medical Museums, Journal of Obstetrics, American Journal of Tuberculosis, Medical Journal of South Africa.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
Clinics each week-day at 2 P.M., Wednesday, Friday, and Saturday also at 10 A.M.
(Details of Post-Graduate Course were given in issue of August 3rd.)

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
Out-patients each day at 2.30 P.M.

THE THROAT HOSPITAL, Golden-square, W.
MONDAY, August 26th.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

EDITORIAL NOTICES.

In consequence of the pressure on our space and the shortage of paper, the Editor may be compelled to abbreviate communications, as an alternative to their rejection, when time does not allow them to be reconsidered by their authors.

It is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

Communications, Letters, &c., to the Editor have been received from—

A.—Major A. Abrahams, R.A.M.C.; Col. J. G. Adami, A.D.M.S.; Mr. C. B. Andrews, Lond.; Mrs. V. Almond, Weston-super-Mare.
B.—Dr. F. Barlow, Lond; Board of Agriculture and Fisheries, Lond.; Mr. W. H. Bowen, Cambridge; Mr. S. S. Barton, Liverpool; Dr. A. E. Brindley, Derby; Messrs. John Bale, Sons, and Danielsson, Lond.; Capt. P. Bahr, R.A.M.C.; British Dentists' Hospital, Lond.; British Hospitals Association, Lond.; Mrs. C. Brereton, Lond.
C.—Capt. J. Campbell, R.A.M.C.; Surg. H. Carlill, R.N.; Dr. W. M. Crofton, Dublin; Mr. G. E. Cope, Finchampstead; Mr. A. L. Cameron, New York; Chicago School of Sanitary Instruction; Capt. C. M. Craig, R.A.M.C.; Central Council for District Nursing in London; Committee concerning Causes of Death, &c., Melbourne, Chairman of, Major D. W. Carmalt-Jones, R.A.M.C.(T.F.)
D.—Dr. W. T. Davies, Llanbister; Decimal Association, Lond; Dr. V. Dickinson, Lond., Dr. M. A. S. Deacon, Liverpool; Dr. H. A. Des Voeux.
E.—Mr W. Eugster, St. Gall; Dr. H. Elliot Blake, Beer; Dr. J. S. Edkins, Lond.
F.—Capt. W. Fletcher, R.A.M.C., Factories, Chief Inspector of, Lond.
G.—Capt. J. A. Glover, R.A.M.C.; General Medical Council, Lond., Acting Registrar of; Dr. H. L. Gordon, Lond.
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O.—Capt. J. R. O'Brien, R.A.M.C.; *Oil and Colour Trades Journal*, Lond.; Optical Munitions, Controller of.
P.—Mr. R. H. A. Plimmer, Lond.; Dr. F. Proud, Maryport; Dr. G. K. Paterson, Edinburgh.
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Notes, Short Comments, and Answers to Correspondents.

THE HOUSEHOLD FUEL AND LIGHTING ORDER.

THE drastic demands of the Fuel Order may well give rise to anxiety for the coming winter. The shortage of coal means now not only a cutting down of the domestic supply of the fuel itself, but of the services of gas and electricity, which are, of course, terms interchangeable with coal. The allowance under the Order imply in no uncertain terms a very severe reduction in the quantities of coal, electricity, and gas which people have been accustomed to consume. Nor can the supplies be equalised on the old basis, for the consumer is informed that he is allowed so many units of gas, electricity, and coal, and he has the difficult task of deciding how to parcel out the allowances of each to his best advantage. If he takes his full allowance of coal, then he can have neither gas nor electricity. The quantity of gas and electricity allowed him is, in other words, dependent upon the reduction he is able to effect in the coal allowance, which already is probably in the large majority of cases a considerable reduction on past consumption. The situation is thus a very difficult one, and we may expect it will lead to one of the worst hardships inflicted upon us by the war so far as home conveniences are concerned. We are glad to see, however, that a clause provides for a special allowance for the invalid and infirm, as well as for the aged and young children. Temporary allowance in case of illness may be granted on production of a medical certificate. The public are advised to study very seriously how best they can tide over the crisis with the least discomfort. Attention should be given particularly to the use of wood, coke, and gas. As much coal as possible should be reserved for the gasworks, where it is economically used, and valuable by-products, including coke, obtained from it. It is devoutly to be hoped that the coming winter will not be severe.

CHLORETONE IN THE TREATMENT OF BURNS.

To the Editor of THE LANCET.

SIR,—I note in your issue of August 17th reference by Dr. H. Mallins to the use of chloretone in the treatment of burns. Until I became acquainted with the different preparations of flavine I used chloretone, not in powder form, but in a solution of olive oil, 30 gr. to 1 oz. I found that the introduction of chloretone relieved the pain and made dressing of the burns a comparatively painless process. The value of chloretone as a local anæsthetic also led me to introduce it into iodine solutions, so that the preliminary agony following the application of iodine solution to a raw surface was abolished.—I am, Sir, yours faithfully,

H. MEARNS SAVERY, M.R.C.S. Eng., L.R.C.P. Lond.

Cleethorpes, Lincs, August 20th, 1918.

TREATMENT OF INFLUENZA IN SWITZERLAND.

IN a useful article in the current number of the principal Swiss medical journal Professor R. Staehelin, of Basle, points out that little is really known of the actual death-rate from the present epidemic of influenza in Switzerland in spite of the alarmist returns in the press, inasmuch as the total number of cases is merely a matter of conjecture. Not much success appears to have attended any particular system of treatment. Professor Staehelin says:—

"We saw no effect from salvarsan, and only fleeting fall of temperature from optochin. Electrargol occasionally gave rise to rigor with resulting fall of temperature and definite improvement of general condition, but for the most part of transient nature. Subjectively antipyretics worked best (of these quinine showed no specially favourable effect), and in particular salicyl preparations, sweating being succeeded by a fall in the fever and increased comfort for several hours. In pneumonia camphor in large doses was the only effective remedy, with of course, venesection where indicated. We should welcome any suggestions from colleagues of a more effective remedy."

The same need is also being felt nearer home.

COLONIAL HEALTH REPORTS.

Bermuda.—According to the Blue-book for 1916, recently received at the Colonial Office, the Registrar-General estimates that the total resident civilian population at the end of the year was 21,215, composed as follows: White, 7282 (3477 male, 3805 female); coloured, 13,933 (6761 male and 7172 female). The birth-rate was 32·2 per 1000 among the resident civilian population, being 23·1 among white residents and 34·00 among coloured residents. The death-rate among resident civilians was 18·67. The illegitimate births were in the proportion of 14·42 per 100 births among the civil population (3·5 white and 18·4 coloured). The death-rate among white resident civilians was 14·42 per 1000 and among coloured residents 20·76. The European infantile mortality rate was 10·8 per 100 living births, and the rate among the coloured population 21·3 per 100, a considerable increase over the rate during 1915, which was 16·1 per cent. The mortality among children under 5 years of age was 35·2 per cent. of the total deaths (excluding stillbirths), as compared with 31·2 in 1915. The deaths from cancer among the resident civil population numbered 16, and those due to tuberculosis 39, being 5 among white inhabitants and 34 among coloured. No outbreak of serious infectious disease occurred. There is no hospital maintained by the Colonial Government, but during 1912 an Act was passed authorising the building of a general hospital, to be known as the King Edward VII. Memorial Hospital. The erection of this hospital was begun during 1913, but the works being interrupted by circumstances arising out of the war only about one-half of the structure was completed at the end of 1916. There is a cottage hospital near the city of Hamilton, which is supported by voluntary contributions, and hospitals are also maintained in connexion with the Imperial Naval and Military establishments. An asylum for the care and treatment of the insane was first established in this colony in 1846. The medical officer of health is the medical superintendent of the institution. Twelve patients (6 male and 6 female) were admitted into the asylum in 1916. Five patients were discharged and 12 died; 66 patients (32 male and 34 female) remained in the institution at the end of the year.

Mauritius.—Reporting on the affairs of the colony for the year 1916, Mr. L. Kœnig, Assistant Colonial Secretary, states that the estimated population, inclusive of Dependencies, was 384,253, an increase of 1513 on that of the previous year, and in the proportion of 492 males and 1021 females. There were 13,161 births, or 67 more than in 1915. The birth-rate was 35·0 per 1000 of the estimated population, as compared with 34·8 per 1000 for 1915. Of the births registered, 4280, or 32·5 per cent., were legitimate and 8881, or 67·5 per cent., illegitimate. The deaths registered were 11,432, or 1669 less than in the previous year. The death-rate was 30·4 per 1000 of the estimated population, as against 34·8, the death-rate in 1915, or a decrease of 4·4. Comparing the infant mortality with the births during the year, 13,161 infants were born and 1932 died at one year of age or under, equal to 16·9 per cent. The percentage under 5 years was 30·5. The principal causes of death throughout the colony during the year were: malaria, 32·6 per cent.; phthisis and other forms of tuberculosis, 18 per cent.; dysentery, 9·8 per cent. 227 cases of enteric fever were notified, with 52 deaths. Plague registered 22 attacks with 15 deaths, giving a death-rate of 68·2 per cent. Port Louis has been plague-free since April 6th, 1915. Trapping and poisoning of rats is carried out continuously. Rat-catchers accounted for 55,532 rats in Port Louis and 66,860 in the districts. Anti-malaria and anti-mosquito measures were continued during the year. The civil hospital in Port Louis, with 275 beds, is the most important of the colony. The number of patients admitted at this institution during the year was 6411, the number discharged 6060, and the daily average in hospital 246. The number of deaths was 329. Of those discharged 3128 were reported as cured, 2605 were relieved, and 327 were not improved. District hospitals are also maintained by Government at Barkly Asylum (Beau Bassin), Mahebourg, Souillac, Long Mountain, Poudre d'Or, Flacq and Moka, with an aggregate accommodation of 592 beds. The total number of cases treated at all district hospitals was 12,164, as against 12,782 in 1915. A new hospital is under construction at Candos, Quatre Bornes, to replace the present hospital buildings at Barkly Asylum. The outlying districts are served by dispensary hospitals and dispensaries for the treatment of emergency and pauper cases. The Immigration Law also requires the maintenance of hospitals on every estate on which there are 20 Indian indentured labourers. There were 72 inmates in the leper asylum at the close of the year, a decrease of 9 as compared with 1915.

THE RISKS OF ETHER IN THE OPERATING THEATRE.

A FATAL accident recently occurred in the operating theatre of the Germiston Hospital, near Johannesburg, South Africa. While preparation was being made for an operation a bottle of anæsthetic ether was upset, part falling on to a nurse's dress and part on a heating radiator, which at once ignited. The nurse with her dress on fire rushed into the corridor, where Dr. Spaulding extinguished the flames by wrapping her in a blanket, being himself burned in the act. The nurse died from her injuries, but the life of the child on the operating table was saved by the presence of mind of a second medical man, Dr. Th. Lund, who was present. In this country it is the rule not to use ether as an anæsthetic when there is any naked flame in the theatre, since it is well recognised that not only is the liquid inflammable but the invisible vapour itself is heavy, and may be wafted a considerable distance and take light unexpectedly.